



Central Vermont Regional Planning Commission

**Water Quality Restoration Formula Grant
Winooski Basin - Sub-grant Application Form
FY24 - Round 2**

The Central Vermont Regional Planning Commission, in its role as the Clean Water Service Provider for the Winooski Basin, is accepting applications for funding for non-regulatory, phosphorous reduction projects that improve water quality. Fiscal Year 2024 - Round 2 proposals are due by 4:00 PM on 13 December 2023. For more information, including submission details, see the [Winooski Clean Water Service Provider webpage](#).

0. Project Eligibility

Please Review the following reference materials before completing your proposal:

- [FY23 Clean Water Initiative Program Funding Policy](#)
- [Act 76, Clean Water Service Provider Rule and Guidance & explanatory materials](#)

Is the portion of the project for which you seek funding both non-regulatory and voluntary? (i.e. not a required or compelled element of a regulatory permit or a legal settlement)? (answer must be Yes to proceed)	
Does the project type meet the applicable definitions and minimum standards in the FY23 Clean Water Initiative Funding Policy ? (answer must be Yes to proceed)	

1. Applicant Information

Organization/Municipality Name:

Primary Contact:

Title:

Mailing Address:

Phone Number:

E-mail Address:

Has the proposing organization / municipality been pre-qualified to receive subcontracts / subgrants from the Central Vermont Regional Planning Commission serving in its capacity as the Winooski Basin Clean Water Service Provider?*

* If you responded no to this question, please include Qualification Materials along with your funding proposal. See the [Winooski Clean Water Service Provider webpage](#) for more details.

2. Project Information

Project Title:

Watershed Projects Database ID*:

* Projects without a Watershed Projects Database ID will be evaluated. However, prior to receiving funding, a project must be entered into the Watershed Projects Database. See pages 11-13 of the [FY23 Clean Water Initiative Funding Policy](#).

Select the most representative project type (according to [Appendix B Project Types Table](#) of the 2023 CWIP Funding Policy) from the dropdown list below.*

* If there is more than one project type associated with the proposal, enter additional project types in the Project Description section below.

Project Phase for which you are seeking funding:

Project GPS coordinates (e.g. 44.26278, -72.58054):

Project Sub-basin:

3. Project Description

*Describe the proposed project. Include the following: project history; the phosphorus reduction practices that will be developed, designed or implemented with the requested funds; **details** of the project development activities, conceptual or final design plans and cost proposals (if available); and **references** to prior plans and studies that support the funding request. Propose a project schedule based on the milestones of the proposed project type. Assume an 8 January 2024 start date. (1000 words maximum)*

4. Staff Capacity & Past Experience

A list of key staff and a (brief) description of their role in the project. If any of the staff listed here were not included in your organization's pre-qualification materials, please attach a one-page resume describing their qualifications to the project proposal.

Name	Project Role

Provide three examples of relevant past work. Include the Watershed Projects Database ID (if applicable), key staff and their role(s) in the project, a brief description of the project (phase, type, partners, etc.) and contact information for project references. Projects listed here should demonstrate the experience of the specific staff anticipated to work under this proposal.

Example Project 1:

Watershed Projects Database ID (if applicable):

Project staff & their project role(s):

Project description (250 words max):

Reference contact information:

Name:

Affiliation:

Phone:

Email:

Example Project 2:

Watershed Projects Database ID (if applicable):

Project staff & their project role(s):

Project description (250 words max):

Reference contact information:

Name:

Affiliation:

Phone:

Email:

Example Project 3:

Watershed Projects Database ID (if applicable):

Project staff & their project role(s):

Project description (250 words max):

Reference contact information:

Name:

Affiliation:

Phone:

Email:

5. Estimated annual total phosphorus load reduction (kg/yr)

Please review the Department of Environmental Conservation's [Standard Operating Procedures \(SOPs\) for Tracking and Accounting of Phosphorous](#) prior to completing this section.

For Developed Lands projects, estimate the annual phosphorous load reduction using the Department of Environmental Conservation's [Stormwater Treatment Practice Calculator](#). Export the results from the calculator and include that information in the proposal package. For Natural Resource Restoration projects, estimate the annual phosphorous load reduction using the Department of Environmental Conservation's [Interim Phosphorous Calculator Tool \(v1.0\)](#). Save the results from the calculator and include them in the proposal package.

Enter the estimated annual total phosphorous load reduction (kg / yr):

If the proposed project consists of project identification / assessment or development-phase work, provide details regarding the types of projects you intend to investigate and the anticipated phosphorus reduction benefits you expect the project(s) might achieve.

6. Project Budget

Develop a detailed budget with a cost breakdown of all project and administrative expenses. The budget should be itemized by Task with anticipated costs for personnel, equipment, materials, subcontracted services and other costs as appropriate. Be sure to request sufficient funding to complete the required milestones and deliverables (including project reporting) for the type of project being proposed. See the [FY23 Clean Water Initiative Program Funding Policy](#) for more information on the milestones required for the project type you are proposing.

Notes:

Mileage: Use the FY24 federal rate (\$0.655 / mile)

Indirect: If you have a negotiated indirect rate, please use that. Otherwise, you may charge up to 10% on all APPLICANT costs and 10% on the first \$50,000 of SUBCONTRACTORS costs.

Funding request

Amount of funding requested:

State matching funds:

Non-State matching funds:

Total project budget:

Future costs

If this proposal seeks funds for Preliminary (30%) or Final (100%) Design-phase work, please estimate anticipated future costs for subsequent project phases. Do not include this amount in the "Funding request" section above.

Anticipated future funding:

7. Co-benefits

- a) **ENVIRONMENTAL JUSTICE:** points are awarded when a project is located in a Census Block Group where one or more Environmental Justice Focus Population demographic conditions exist. *This value is calculated by the Clean Water Service Provider based on the project location.*
- b) **ECOLOGICAL BENEFITS:** points are awarded when a project reduces sediment and / or non-phosphorous nutrient loads to stressed, altered, impaired or priority waterways to which it is hydrologically connected. *This value is calculated by the Clean Water Service Provider based on the project location.*
- c) **ECOSYSTEM SERVICES:** points are awarded when a project moderates natural phenomena through carbon sequestration and flood resilience. *This value is calculated by the Clean Water Service Provider based on the type of project being proposed.*
- d) **COMMUNITY BUILDING:** points are awarded when a project involves the community in data collection and decision-making, enhances the working landscape and provides recreational benefits. Please answer the following:

- ◇ Are there proposed efforts to meaningfully involve community members in planning, project development, decision-making and implementation?

If you answered Yes to the previous question, please describe the effort to involve community members:

- ◇ Does the project involve data collection by community members (e.g. citizen science initiative)?

If you answered Yes to the previous question, please describe the effort to involve community members in data collection:

- ◇ Is the project located on a parcel that is enrolled in the Use Value & Appraisal Program (aka the Current Use Program) (Contact the Clean Water Service Provider for assistance.)?
- ◇ Does the project maintain / improve an existing recreational space?

If you answered Yes to the previous question, please describe the maintenance or improvement of existing recreational space(s):

- ◇ Will the project result in new / expanded recreational opportunities?

If you answered Yes to the previous question, please describe the effort to create new or expand existing recreational opportunities:

e) **EDUCATION:** An Education Co-Benefit is realized when a project includes aspects of public outreach designed to educate community members about the importance of phosphorus reduction and watershed health

- ◇ Will the project include an educational component?

If you answered Yes to the previous question, please describe the educational component of the project below:

- ◇ Interpretive signage:

- ◇ Educational meetings / workshops:

8. Other Considerations

a) **DESIGN LIFE:** The design life of the proposed project is:

b) **LANDOWNER RELATIONS**

◇ **PROPERTY OWNERSHIP:** The project will be located on:

◇ **LANDOWNER SUPPORT:** Provide a list of landowner support letters below. Please submit any letters or email from the landowner indicating their support for the project and awareness of their required commitment. Note date of letter/email and sender below.

◇ **OTHER:** Include other information regarding landowner relations here.

c) **OPERATIONS & MAINTENANCE**

◇ **COST ESTIMATE:** Provide a quantitative estimate of operation & maintenance costs on an annual basis where available. If not available, please provide a qualitative estimate. The anticipated annual operations & maintenance expenses for this project are:

◇ **O & M AGREEMENT:** There is a signed operations & maintenance agreement for this project:

If you answered Yes to the previous question, please include a copy of the signed O & M Agreement in the proposal package.

◇ **OTHER:** Include any other information regarding the operations & maintenance agreement for this project.

d) **PERMITTING:** This project will require a permit:

If you answered Yes to the previous question, please provide a list of the required permits, any issues anticipated in obtaining the permits and the status of the permit. If you have permit(s) for the project in hand, please include a copy of them in the proposal package.

e) **BARRIERS:** Describe any potential barriers to completing this project and how you plan to manage those challenges:

f) **HISTORIC SITE REVIEW:** Consult the [Vermont Historic Sites spreadsheet](#) and accompanying guidance in the State Historic Preservation Review section of the [FY23 Clean Water Initiative Program Funding Policy](#) to determine whether the proposed project will require Preliminary and Final Project Review by the Vermont Division of Historic Preservation. Include a copy of the completed Vermont Historic Preservation Project Review Form in the proposal package.

◇ The proposed project will require State Historic Preservation Review:

9. Proposal Submission

Assemble the following materials in the order listed into a single PDF and submit to Brian Voigt (voigt@cvregion.com) with the Subject line: "Basin 8 Clean Water Service Provider Project Proposal – FY24, Round 2".

1. If your organization or municipality has not yet been pre-qualified as an eligible Basin 8 Clean Water Service Provider Clean Water Partner, please complete and submit a [pre-qualification form](#) along with your funding proposal.
2. Project proposal form (i.e. this document).
3. Include the following information in the order listed (please):
 - a) [Natural Resources Screening Form](#) (see the FY23 Clean Water Initiative Program Funding Policy – Appendix A. Required for preliminary design, final design, or implementation phase projects.)
 - b) Project Locator Map – applicants may use the [Vermont Agency of Natural Resources Atlas](#) to generate the Project Locator Map (Contact the Clean Water Service Provider for assistance.)
 - c) Project Timeline – Propose a project schedule based on the milestones of the proposed project type. Assume an 8 January 2024 start date.
 - d) Staff capacity – list key staff and their role(s) in the project. Attach one-page resumes for any staff listed in Section 4 of the Application Form who were not included in your pre-qualification materials.
 - e) Completed [DEC Interim Phosphorus Reduction Calculator Tool v1.0](#), or, for Developed Land Projects, report from [DEC Stormwater Treatment Practice Calculator](#). (Contact the Clean Water Service Provider for assistance.)
 - f) Detailed project budget with a cost breakdown of all project and administrative expenses. The project should be itemized by Task with anticipated costs for personnel, equipment, materials, subcontracted services and other costs as appropriate. Be sure to request sufficient funding to complete the required milestones and deliverables (including project reporting) for the type of project being proposed.
 - g) Letter(s) of support from landowner(s) indicating their support for and awareness of the commitment required to advance / implement the project
 - h) Signed Operations & Maintenance Agreement (if applicable)
 - i) Permits – Attach approved project permits (if applicable).
 - j) Historic Site Review - Use the [spreadsheet](#) and accompanying guidance in the State Historic Preservation Review section of the [FY23 Clean Water Initiative Program](#) Funding Policy to determine whether your clean water project will require Preliminary and Final Project Review by the Vermont Division of Historic Preservation. Attach a copy of the completed Vermont Historic Preservation Project Review Form.

APPENDIX A. CLEAN WATER INITIATIVE PROGRAM - PROJECT ELIGIBILITY SCREENING FORM

This fillable PDF form is designed to assist with project review by systematically walking through all eligibility criteria. It should be completed for all projects seeking funding for 30% + design or implementation work. It may be applied to projects seeking funding for assessment or development if helpful for determining their alignment with eligibility criteria 2, 3, 6, and 8.

Step 1: Conduct Eligibility Criteria #1 Screening: Project Purpose

Table 1A: Project Purpose	
From the drop-down list to the right, please select which of the four objectives of Vermont's Surface Water Management Strategy this project addresses. If multiple, please list below:	

Step 2: Conduct Eligibility Criteria #2 Screening: Project Types and Standards

Table 2A: Project Types and Standards		
Please select the most representative project type from the drop-down list to the right. ^{1,2} If multiple BMPs are included in the project, please list below:		
Is the project type an eligible project type for the funding program you are applying to as listed in column B of the CWIP Project Types Table ? (Answer must be YES to proceed)	Yes	No
Does the project meet the project type definitions and minimum standards as provided in column C of the CWIP Project Types Table ? (Answer must be YES to proceed)	Yes	No
Will the project result in the standard performance measures, milestones, and deliverables as defined by project type in columns D-F of the CWIP Project Types Table ? (Answer must be YES to proceed)	Yes	No
Is the project listed as an ineligible project or activity in the CWIP Funding Policy ? If Yes, please explain below how project meets the allowable exceptions within the CWIP Funding Policy. (Answer must be NO to proceed, unless reasonable justification is provided above)	Yes	No

Step 3: Conduct Eligibility Criteria #3 Screening: Watershed Projects Database

Verify project has been recorded in the [Watershed Project Database](#) (WPD). Each project must have a Watershed Project Database number specific to the proposed project phase (for example,

¹ Note that Road/Stormwater Gully project-types must not otherwise be considered intermittent or perennial streams by the DEC Rivers Program and therefore project proponent must show documentation of this determination in order to select this project type.

² One project may include multiple best management practices (BMPs) that cross "project types." For example, a single project may include both stormwater and lake shoreland BMPs. Proponents should use their best judgement in selecting the most representative project type for the purposes of eligibility screening and reporting.

a final design will have a different WPD-ID from a preliminary design even if for the same project). If the project, or the specific phase, is not yet in the Watershed Project Database, follow directions provided in the CWIP Funding Policy to secure a WPD-ID. Please see [CWIP Funding Policy](#) for more information on the WPD-ID.

Table 3A. WPD-ID	
Watershed Project Database ID number assigned	
Watershed Project Database Project Name	

Step 4: Conduct Eligibility Criteria #4 Screening: Natural Resource Impacts³

Agency of Natural Resources (ANR) permit screening for natural resource impacts includes 1) an initial desktop review to identify which ANR permitting programs should be contacted, 2) a review by the relevant ANR permitting staff, and 3) a response summary from the project proponent addressing any permitting staff concerns. ⁴

- 1) **Table 4. Natural Resource Impacts** facilitates a high-level desktop review of the most likely ANR permits to apply to clean water projects. Project proponents should answer all the questions to identify likely permit needs. ⁵ Please note that “project site” may include both the active restoration location as well as any additional impact footprint related to staging, site access, or storage of waste or disposed materials.
- 2) If responses to the **Table 4. Natural Resource Impacts** desktop review trigger a permitting staff consultation, **Table 4** provides appropriate contact information.
 - a. Proponents should send the identified permitting staff the following:
 - i. The watersheds project database identification number (WPD-ID) (if available),
 - ii. Project location (GPS coordinates)
 - iii. Summary of proposed scope of work, and
 - iv. Any other relevant information they request that will be utilized in their review.
 - b. **Proponents should clarify they are seeking permitting staff input on potential permitting needs, permit-ability of proposed scope of work, and other design considerations but they are NOT seeking a formal permit determination.**
 - c. Project proponents must attempt to communicate with the permitting staff and provide them with at least thirty days to review the project and provide a

³ Easements and Riparian Buffer Plantings are excluded from this eligibility requirement/step.

⁴ In cases where this screening may have already occurred in a prior project phase, project proponents may supply attachments or links to relevant permit needs assessment documents in place of completing Table 4.

⁵ Entities selected for funding are expected to perform due diligence to ensure all applicable permits (including non-ANR state, local, and federal permits) are discovered and secured prior to implementation. The [ANR Permit Navigator](#) and an Environmental Compliance Division Community Assistance Specialist can help confirm ANR permitting needs for any projects once selected for funding.

response. Project proponents are encouraged to perform this screening during a project development phase as opposed to during a project solicitation round to allow for more time for feedback. Permitting feedback may be up to one year old.

- 3) Proponents should summarize permitting staff feedback and how the proposed scope of work will address this at the bottom of **Table 4**. Specifically, please include:
 - a. Which permits or permit amendment are needed or might be needed?⁶
 - b. What type might be needed? (e.g., a general or individual permit⁷)?
 - c. What concerns were voiced by permitting staff?
 - d. How will the proposed scope of work address these concerns?⁸

Table 4A: Natural Resource Impacts		
I. Act 250 Permits		
1. Have any Act 250 (Vermont’s Land Use and Development Control Law) Permits been issued in the project site’s parcel location?⁹	Yes	No
If yes , please provide the permit number and list any water resource issues or natural resource issues found ¹⁰ :		
PermitNumber:		
ResourceIssues: _____		
If yes , use the Water Quality Project Screening Tool to identify the appropriate regulatory contact for an Act 250 consultation.		
Regulatory Point of Contact Name/Position:		
II. Lake and Shoreland		
1. Is the project site located within 250 feet of the mean water	Yes	No

⁶ Occasionally permit staff may indicate they need a field visit or to see more completed designs prior to making a permit need determination.

⁷ Design phase projects that require an individual wetlands permit must have the permit in hand at the close of the final design phase. Implementation phase projects must have the individual permit in hand to be eligible for funding.

⁸ Examples could include planned design changes or inviting permitting staff to stakeholder meetings.

⁹ An Act 250 Permit is required for certain categories of development, such as subdivisions of 10 lots or more, commercial projects on more than one acre or ten acres (depending on whether the town has permanent zoning and subdivision regulations), and any development above the elevation of 2,500 feet. The [ANR Atlas Clean Water Initiative Program Grant Screening tool](#) can help answer this yes/no question. Follow the instructions on the link above to identify whether your project is located on an Act 250 parcel. Note that the layer to activate in ANR Atlas is now named “Clean Water Initiative Program Grant Screening.”

¹⁰Note that Act 250 permit amendments may require more extensive review of project impacts to natural resources including wildlife habitat, significant natural communities, and riparian zones. Please consult with the Act 250 District Coordinator regarding the nature and scope of that review and what bearing it may have on your project design.

level (shoreline) of a lake or pond? ¹¹		
<p>If yes, you might need either a Shoreland Protection Act Permit or a Lake Encroachment Permit. Use the Water Quality Project Screening Tool to find the Lakes and Ponds Program contact for your project's region.</p> <p>Regulatory Point of Contact Name/Position:</p>		
III. Rivers, River Corridors, and Flood Hazard Areas		
<p>1. Is there any portion of the project site located within 100' of a river corridor and/or mapped Federal Emergency Management Agency (FEMA) flood hazard area¹²? (e.g. a stormwater pond's pipe draining into a river corridor area)? Any permanent excavation/filling or construction within a flood hazard area or river corridor may trigger regulatory requirements through municipal bylaws or through state authorities.</p>	Yes	No
<p>If yes, you will need to speak with a Floodplain Manager. Use the Water Quality Project Screening Tool to find the Floodplain Manager for your project's region.</p> <p>Regulatory Point of Contact Name/Position:</p>		
<p>2. Is any portion of the project site within a perennial river or stream channel?</p> <p>¹³</p>	Yes	No
<p>If yes, you will need to speak with a Stream Alteration Engineer. Use the Water Quality Project Screening Tool to find the Stream Alteration Engineer for your project's region.</p> <p>Regulatory Point of Contact Name/Position:</p>		
IV. Wetland		

¹¹ The [ANR Atlas Clean Water Initiative Program Grant Screening tool](#) can help answer this yes/no question. Follow the instructions on the link above to identify whether your project is located in the jurisdictional zone to trigger a Lakeshore permit. Note that the layer to activate in ANR Atlas is now named "Clean Water Initiative Program Grant Screening."

¹² FEMA mapped Flood Hazard Areas are not available statewide on the ANR Natural Resources Atlas. For projects located in Grand Isle, Franklin, Lamoille, Addison, Essex, Orleans, Caledonia, and Orange Counties, maps are available via the FEMA Flood Map Service Center: <https://msc.fema.gov/portal/home>. ANR Floodplain Managers are available to provide technical assistance if needed.

¹³ Stream Alteration Permits regulate all activities that take place within perennial river and stream channels. Examples of regulated activities include streambank stabilization, dam removal, road improvements that encroach on streams, and bridge/culvert construction or repair. The [ANR Atlas Clean Water Initiative Program Grant Screening tool](#) can help answer this yes/no question. Follow the instructions on the link above to identify whether your project is located in the jurisdictional zone to trigger a Stream Alteration permit. Note that the layer to activate in ANR Atlas is now named "Clean Water Initiative Program Grant Screening."

<p>1. Does the Wetland Screening Tool¹⁴ provide a result of wetlands likely, very likely, or present at the project site?</p>	<p style="text-align: center;">Yes No</p>
<p>2. Does your project site involve land that is in or near an area that has <u>any</u> of the following characteristics:</p> <ul style="list-style-type: none"> o Water is present – ponds, streams, springs, seeps, water filled depressions, soggy ground under foot, trees with shallow roots or water marks? o Wetland plants, such as cattails, ferns, sphagnum moss, willows, red maple, trees with roots growing along the ground surface, swollen trunk bases, or flat root bases when tipped over? o Wetland Soils – soil is dark over gray, gray/blue/green? Is there presence of rusty/red/dark streaks? Soil smells like rotten eggs, feels greasy, mushy or wet? Water fills holes within a few minutes of digging? (See Landowners Guide to Wetlands for additional information on identifying wetlands onsite.) 	<p style="text-align: center;">Yes</p> <p style="text-align: center;">No</p> <p style="text-align: center;">Not Sure</p>
<p>If you answered yes or not sure to <u>either</u> of the above questions, you will need to contact your District Wetlands Ecologist using the Wetland Inquiry Form. The District Wetlands Ecologist can help determine the approximate locations of wetlands and whether you need to hire a Wetland Consultant to conduct a wetland delineation. Alternatively, if you answered yes or not sure to <u>either</u> of the above questions, you can simply budget for a Wetland Consultant in the proposed scope of work. Any activity within a Class I or II wetland or wetland buffer zone (minimum of 100 feet and 50 feet respectively) which is not exempt or considered an “allowed use” under the Vermont Wetland Rules requires a permit. All permits must go through review and public notice process, which takes at minimum 6 weeks for a General Permit and 5 months for an Individual Permit.</p> <p>Regulatory Point of Contact Name/Position:</p>	
<p>1. Is your project a Wetland Restoration project type?</p>	<p style="text-align: center;">Yes No</p>
<p>If you answered yes, under the Vermont Wetland Rules you will need an “allowed use” determination from the DEC Wetlands Program. Contact your District Wetlands Ecologist using the Wetland Inquiry Form.</p> <p>Regulatory Point of Contact Name/Position:</p>	
<p>V. Fish and Wildlife</p>	
<p>State law protects endangered and threatened species. No person may take or possess such species without a Threatened & Endangered Species Takings permit.</p> <p>1. Does your project involve cutting down trees larger than 5 inches in diameter in any of the following towns? Addison, Arlington, Benson, Brandon, Bridport, Bristol, Charlotte, Cornwall, Danby, Dorset, Fair Haven, Ferrisburgh, Hinesburg, Manchester, Middlebury, Monkton, New Haven, Orwell, Panton, Pawlet, Pittsford, Rupert, Salisbury, Sandgate, Shoreham, Starksboro, St. George, Sudbury, Sunderland, Vergennes, Waltham, West Haven, Weybridge, Whiting</p>	<p style="text-align: center;">Yes No</p>

¹⁴ To view the Wetland Screening Tool introduction video, see <https://youtu.be/6lv5en0AB1o>

2. Is the project site within 1 mile of a mapped¹⁵ Significant Natural Community or Rare, Threatened, or Endangered Species?	Yes	No
<p>If yes to either of the above questions, connect with the VT Fish and Wildlife department (everett.marshall@vermont.gov 802-371-7333) to discuss your project and any necessary permitting.</p> <p>Regulatory Point of Contact Name/Position:</p>		
VI. Stormwater		
1. Will the project disturb more than an acre of land during construction, add or redevelop impervious surface, create new development or otherwise require a Stormwater permit?	Yes	No
<p>If yes, forward to the appropriate Stormwater specialist to ensure necessary permitting. Use the Water Quality Project Screening Tool to find the Stormwater specialist for your project's region.</p> <p>Regulatory Point of Contact Name/Position:</p>		
VII. Solid Waste		
2. Will you be creating any debris (including construction and demolition waste, stumps, brush, untreated wood, concrete, masonry, and mortar) with your project that you intend to bury on site? ¹⁶	Yes	No
<p>If yes, connect with the Waste Management & Prevention Division (dennis.fekert@vermont.gov 802-522-0195) to discuss your project and any necessary permitting.</p> <p>Regulatory Point of Contact Name/Position:</p>		
<p>Provide below or attach a narrative summary of Table 4 findings. Please include:</p> <ol style="list-style-type: none"> Which permits or permit amendment are needed or might be needed? What type might be needed? (e.g. a general or individual permit)? What concerns were voiced by permitting staff? How will the proposed scope of work address these concerns? 		
Is the project, as proposed, reasonably considered permit-able by all applicable	Yes	No

¹⁵ Find both of these layers on the ANR Atlas under Atlas Layers/Fish and Wildlife. Use the Measurement tool to 1) Plot Coordinates for your project 2) select the coordinates from the left panel 3) select the Radius Tool 4) click on your project location 5) Indicate 1 mile distance 6) look for overlap with either of these mapped layers.

¹⁶ If your project will result in the transfer and disposal of debris (including construction and demolition waste, stumps, brush, untreated wood, concrete, masonry and mortar), you do not need a permit from this office as long as you hire a [licensed solid waste hauler](#) and bring the material to a certified facility.

ANR permitting programs? (Answer must be Yes to continue)	
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Step 5: Conduct Eligibility Criteria #5-8 Screenings

Table 5A. Eligibility Criteria 5-8		
Landowner and Operation and Maintenance Responsible Party Support. Project identifies and demonstrates commitment from a qualified and willing operation and maintenance responsible party. Project demonstrates landowner support for the proposed project phase. (Answer must be YES to proceed)	Yes	No
Budget. Project budget includes ineligible expenses. (Answer must be NO to proceed)	Yes	No
Leveraging. Proposed leveraging meets required leveraging levels (if applicable), meets the definition of leveraging, and comes from eligible sources (Answer must be YES or N/A to proceed)	Yes	No N/A
Funding Program Specific Eligibility. Project meets additional funding program eligibility requirements*. Please list applicable funding program below: (Answer must be YES to proceed) *If Water Quality Restoration Formula Grant, complete Step 6 below	Yes	No

Step 6: Screening Projects on Agricultural Lands (Water Quality Restoration Formula Grants Only)

For Water Quality Restoration Formula Grant projects, please complete the following information as part of your Funding Program Specific Eligibility Screening (Criteria 8). Please note this must be completed for all projects located on agricultural lands regardless of project type. See [CWIP Project Types Table](#) for eligible project types.

Table 6A. Screening Projects on Agricultural Lands	
1. Is the proposed project located on a jurisdictional farm operation ¹⁷ ? Complete a preliminary review to	Yes - Proceed to next question below.

¹⁷ Jurisdictional farm operations are required to meet Vermont’s Required Agricultural Practices (RAPs).

<p>determine if it is a jurisdictional farm operation, and any case that requires consultation with AAFM will occur via the farm determination process. Please note this form must be submitted by the farm operation/landowner seeking the determination.</p>	<p>No¹⁸ - There is no additional requirements related to agricultural review for these projects.</p>
<p>2. Is the proposed project an agricultural project?</p> <p>Examples of agricultural projects include but are not limited to Production Area Practices – (e.g. Waste Storage Facilities, Heavy Use Area, Diversion) Fence, Livestock Exclusion, Filter Strip, Cover Crop, Reduced Tillage, Manure Injection, Rotational Grazing. Please note this is not an exhaustive list of all agricultural practices.</p>	<p>Yes - Agricultural Projects on jurisdictional farms are not an eligible project type. You can provide a referral to an applicable state or federal agricultural assistance program, or a local organization.</p> <p>No- The natural resource, innovative, or other project type will require an agricultural project review and approval from the Vermont Agency of Agriculture, Food and Markets (VAAFAM) to ensure a consistent approach on farms statewide that follows rules, regulations, and laws in place. Please follow Steps 1 & 2 below.</p> <p>Step 1- Please submit a detailed description of the project, project site, project details, landowner, farm operation, and any other relevant information to VAAFAM at AGR.WaterQuality@Vermont.gov .</p> <p>Step 2- Once you complete this Agricultural Project Review, please allow 30 days for a response. Once that response has been received, please include a summary of the response in the next section.</p>
<p>Agricultural Project Review Status & Summary:</p>	
<p>Check as Applicable</p>	<p>Status</p>
	<p>Submitted/ Pending</p>
	<p>Approved</p>
	<p>Denied</p>

¹⁸ Note CWIP’s Agricultural Pollution Prevention project type eligibility is limited to land where owner or operator is not a jurisdictional farm (i.e., not required to meet the Required Agricultural Practices (RAPs)). As such, projects that meet the definition of the Agricultural Pollution Prevention project type in the [Appendix B. Project Types Table](#) are not subject to review by VAAFAM.

Please include a summary of the response here:

Please note that it is expected that all projects with the status “submitted/pending” will be “approved” prior to a project approval for funding.

Basin 8 Strategic Wood Additions - Final Design, Project Schedule

Deliverable	Anticipated completion dates
Documentation of stream incisions and precise opportunities for floodplain engagement	April 30, 2024
Draft 10-year (minimum) DEC Operation and Maintenance (O&M) Plan and documentation of support/commitment from O&M responsible party and landowner	April 30, 2024
Draft 10-year (minimum) access license or easement and documentation of project support/commitment from landowner	April 30, 2024
Completed permitting	April 30, 2024
VDHP Project Review Forms Submitted	April 30, 2024
DEC programmatic staff comments on design	May 31, 2024
Final Design Report	June 15, 2024
Media announcement	June 15, 2024
Final Performance Report	July 30, 2024

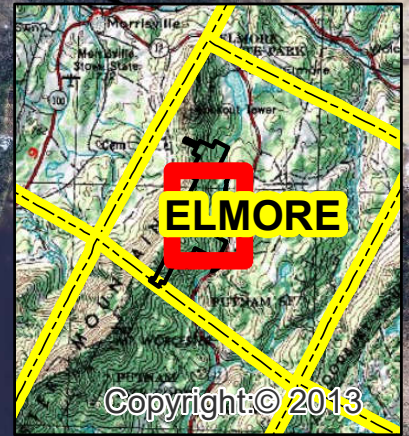
Project Data Summary and Location Maps

1. North Branch Winooski Rocky Woods Strategic Wood Additions
 - a. Landowner: Rocky Woods Investments II LLC
 - b. Sub-basin: Headwaters of the North Branch of the Winooski (VT 08-13)
 - c. Town: Elmore
 - d. Coordinates: 44.47309° N, 72.53721° W
 - e. Annual P reduction: 60.9 kg
 - f. WPD ID: 11654
2. Lake Mansfield Headwaters Strategic Wood Additions
 - a. Landowner: Lake Mansfield Trout Club
 - b. Sub-basin: Miller Brook to Lower Little River (VT 08-11)
 - c. Town: Stowe
 - d. Coordinates: 44.479354° N, 72.82166° W
 - e. Annual P reduction: 5.0 kg
 - f. WPD ID: 11655
3. Long Meadow Brook Strategic Wood Additions
 - a. Landowner: Carley Claghorn
 - b. Sub-basin: Long Meadow Brook to North Branch of the Winooski (VT 08-13)
 - c. Town: East Montpelier
 - d. Coordinates: 44.33179° N, 72.54765° W
 - e. Annual P reduction: 5.0 kg
 - f. WPD ID: 11656
4. Mollys Brook Tributary Strategic Wood Additions
 - a. Landowners: Gulka, Pendergraft, Feltus, and Jones-Lippy
 - b. Sub-basin: Mollys Brook to Headwaters of the Winooski (VT 08-09)
 - c. Town: Cabot
 - d. Coordinates: 44.0020° N, 72.23030° W
 - e. Annual P reduction: 9.2 kg
 - f. WPD ID: pending

STRATEGIC WOOD ADDITIONS MAP
FOR PROPERTY BELONGING TO

Rocky Woods Investments II LLC

in Elmore, Vermont



North Branch Winooski Trib 6 S1

North Branch Winooski Trib 6 S2

North Branch Winooski Trib 6 S3

North Branch Winooski Trib 7

North Branch Winooski Trib 6 S4

Total length of planned SWA: 1.98 miles

Total area floodplain planned for re-connection: 7.85 acres

Legend

- Planned SWA Areas
- RW_friends_floodplainaccess
- Parcel Boundary

Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400

This map was created from the Town tax maps,
handheld GPS points, and on the ground observations.

THIS IS NOT A SURVEY

1:15,000



0.3 Miles
1 inch = 1,250 feet

Map Created By: Redstart
October 2023

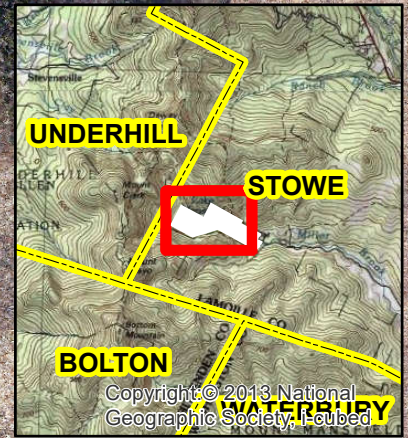


VCGI

STRATEGIC WOOD ADDITIONS MAP
FOR PROPERTY BELONGING TO

Lake Mansfield Trout Club

in Stowe, Vermont



Lake Mansfield Trib 5

Lake Mansfield Trib 4

Lake Mansfield Trib 3

Lake Mansfield Trib 2

Lake Mansfield Trib 1

Lake Mansfield Trib 6

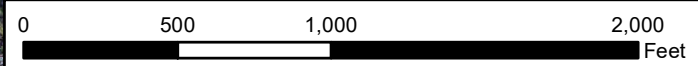
Miller Brook Trib 1

NEBRASKA VALLEY RD

Legend

- Planned SWA Areas
- Planned Areas for Floodplain Connectivity
- Town Road
- Parcel Boundary

Total planned length of restored stream: 2,825 ft
Total planned area of re connected floodplain: 0.9 acres



Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400
This map was created from the Town tax maps,
handheld GPS points, and on the ground observations.
THIS IS NOT A SURVEY



1 inch = 625 feet

Map Created By: Redstart
10/2023

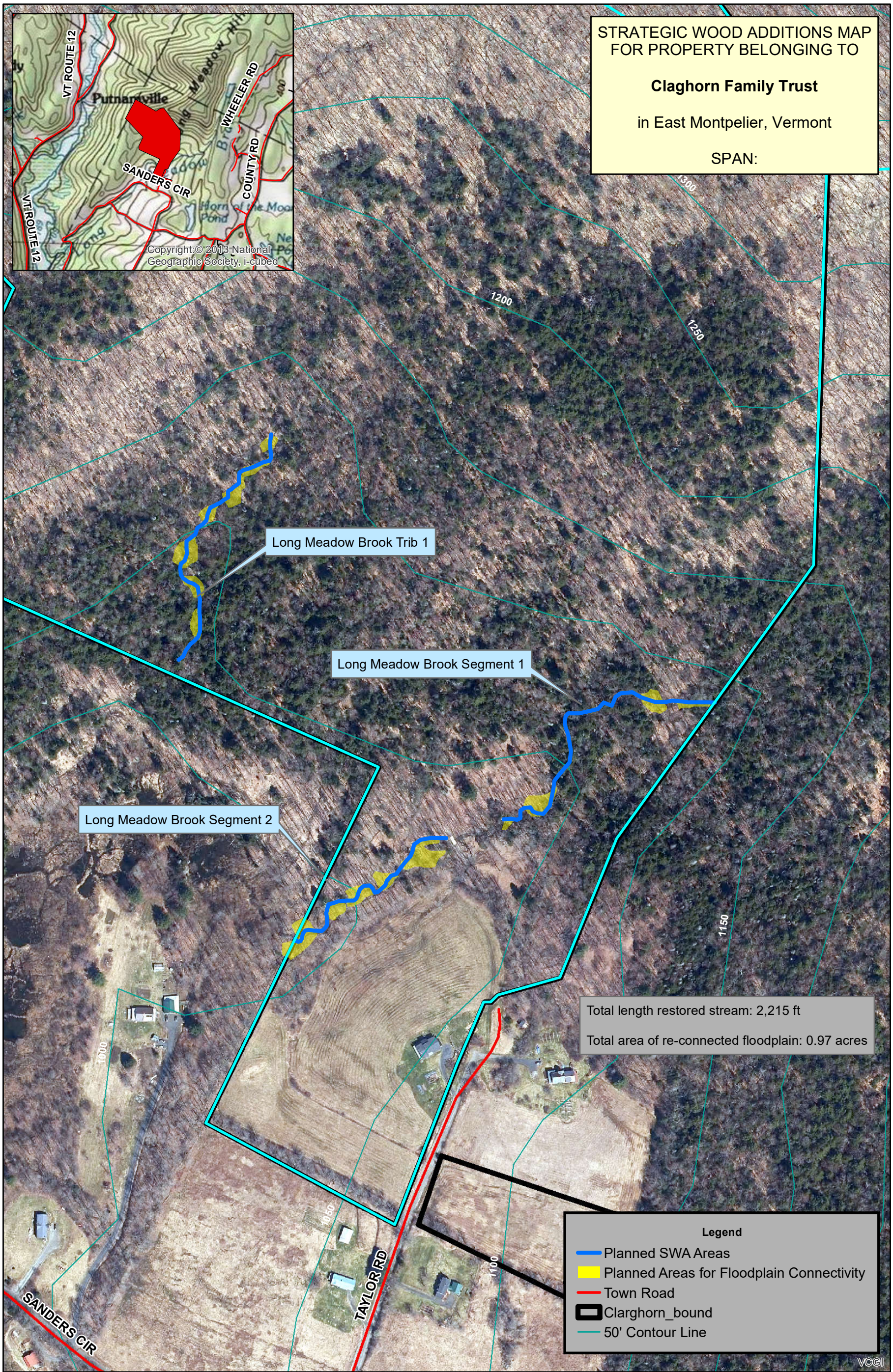
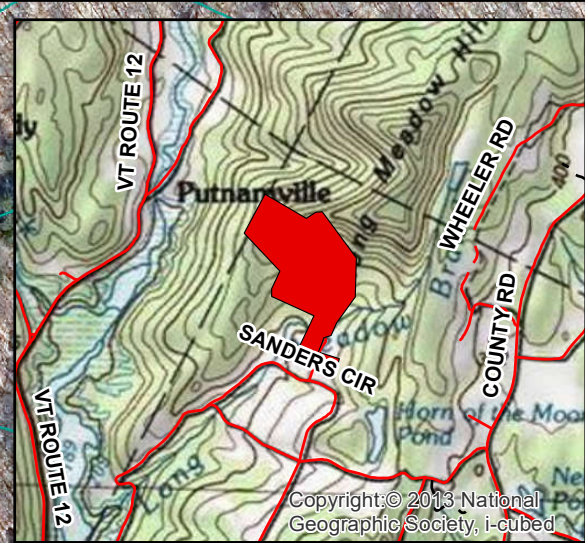


STRATEGIC WOOD ADDITIONS MAP
FOR PROPERTY BELONGING TO

Claghorn Family Trust

in East Montpelier, Vermont

SPAN:



Total length restored stream: 2,215 ft
Total area of re-connected floodplain: 0.97 acres

Legend

- Planned SWA Areas
- Planned Areas for Floodplain Connectivity
- Town Road
- Claghorn_bound
- 50' Contour Line

Orthophoto Series 5000: 2022
Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400
This map was created from the Town of East Montpelier tax maps, handheld GPS points, and on the ground observations.
THIS IS NOT A SURVEY

N
1:3,000
1 inch = 250 feet

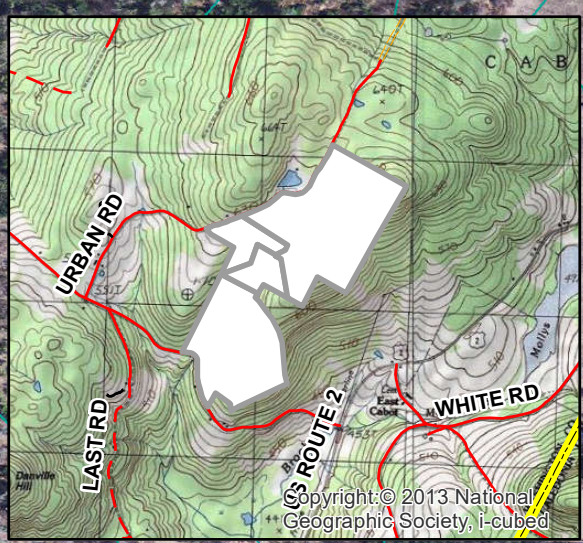
0 150 300 600 Feet

Map Created By: Redstart
10/2023



VCGI

STRATEGIC WOOD ADDITIONS MAP
FOR PROPERTIES BELONGING TO
**GARY GULKA, BILL PENDERGRAFT,
ED FELTUS, KATHERINE JONES-LIPPY**
in Cabot, Vermont



211000

210500

210000

211000

210500

210000

518500

519000

518500

519000

Legend

- Planned SWA Areas
- Planned Areas of Floodplain Reconnection
- Parcel Boundaries
- Town Road
- 50' Contour Line

Total length of planned SWA: 0.81 miles
Total area of planned floodplain reconnection: 1.81 acres

Orthophoto Series 5000; 2015
Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400
This map was created from the Town of Cabot tax maps, handheld GPS points, and on the ground observations.
THIS IS NOT A SURVEY

N
1 inch = 333.3 feet
1:4,000

0 200 400 800 Feet

Map Created By: Redstart
12/2023





James King

2332 Goose Green Rd
Corinth, VT, 05033
607-592-6678

james@redstartconsulting.com

Education

Cornell University, MPS in Natural Resources, Sep. 2019 – Aug. 2020

- Authored and presented Capstone Project, “Initiating an Agroforestry Community Enterprise in Cambodia: A Facilitative Approach to Socio-Ecological Resilience.”

University of Vermont, BA in Geography, Sep. 2014 – Dec. 2017

- Double minors in Forestry and Music

SFS Center for Conservation and Development Studies, Siem Reap, Cambodia, Aug. – Dec. 2016

- Completed advanced-level coursework while applying collaborative skills in grant application, experiment design, qualitative data gathering and analysis, and presenting results to diverse audiences.

Experience

Forestry, Restoration, & Invasive Species Technician, Redstart Inc., Corinth, VT, June 2022-present

- Developing stream restoration projects (strategic wood additions) through initial scouting, design, and funding phases.
- Research and stakeholder engagement on beneficial impacts of the strategic wood additions technique.
- Crew member and crew lead in regional field work to control invasive plants, restore stream habitat, release crop trees, plant riparian trees and shrubs, perform carbon inventory, plan NRCS-conservation practices, and more.
- Organizing and maintaining company equipment for invasive plant control.

Social Enterprise Officer, The Cambodian Community Dream Organization, Siem Reap, Cambodia, Mar. 2019 – Mar. 2020, Remote, Mar. 2021 – Jun. 2021

- Led project development for CCDO’s Agroforestry Community Enterprise: • designed and implemented community assessment • coordinated project stakeholder network to support over 20 farmers in development of improved land management and value-chain strategies • developed frameworks for project implementation, evaluation, and financing.
- Co-founded CCDO’s Safe Homes Project: collaborated with donors and community leaders to identify over 100 families in greatest need of new roofs in rural Siem Reap • developed survey tools, online databases, and reporting templates for project implementation

Agri-Cluster Retention & Expansion Project Intern, The Lyson Center, remote, Sep.– Nov. 2020

- Remotely assisted research and coordination efforts to development regional planning processes for value-chain advantages to “black dirt” onion producers across New York state.

Field & Laboratory Technician, NYS Hemlock Initiative, Ithaca, NY, Feb. 2018 – Jan. 2019

- Implemented statewide hemlock woolly-adelgid biocontrol, via field surveys and insect releases.
- Conducted fieldwork with partners, including NYS Department of Environmental Conservation, State Parks, land trusts, arborists, and community scientists.

VT-FEED and Garden Intern, NOFA-VT, Richmond, VT, Jun. – Aug. 2017

Crew Member, Westhaven Farm, Ithaca, NY, 2013 – 2016

Skills and Certifications

- Licensed commercial pesticide application in VT and NH,
- Game of Logging level 1 certified.
- Proficient in Microsoft Office, ArcGIS Desktop.

Charles Dana Hazen
2727 Christian Steet
White River Junction, VT 05001
Dana@redstartconsulting.com
(802) 439-5252 x 6

Education:

Paul Smith's College (SAF Accredited) May 2012

- B.S. Ecological Forest Management
- Business Minor
- GIS Certificate
- GPA 3.70 Cumulative

Hartford High School June 2008

- High School Diploma
- Completed the Natural Resource program at Hartford Area Career and Technology Center

Employment:

Partner, Forester and Manager

Redstart Consulting **Oct. 2016 – Present**

- Forest management planning
- Bidding on invasive plant projects
- Writing plans for Vermont's UVA program
- Managing invasive plant projects
- Timber cruising
- General administrative of forestry related tasks for The Conservation Fund's lands in VT & NH as well as lands owned by Bear Hill Conservancy Trust.
- Carrying out herbicide application
- Marking timber sales
- Tree planting
- Monitoring log jobs
- GIS mapping

Forester and Invasive Plant Manager

New England Forestry Consultants **Nov. 2015 – Sept. 2016**

- Forest management planning
- Bidding on invasive plant projects
- Writing plans for Vermont's UVA program
- Managing invasive plant projects
- Timber cruising
- Carrying out herbicide application
- Marking timber sales
- Tree planting
- Monitoring log jobs
- GIS mapping

Forester and Invasive Plant Specialist

Redstart Consulting **May 2012 – October 2015**

- Forest management planning
- Coordinating invasive plant projects
- Writing plans for Vermont's UVA program
- Carrying out herbicide application
- Timber cruising
- Monitoring Emerald Ash Borer traps
- Marking timber sales
- Christmas tree pruning
- Monitoring log jobs
- Apple tree pruning
- GIS mapping Tree planting

Certifications, Personal Interests, and Achievements

- Licensed Forester Vermont and New Hampshire
- Commercial Pesticide Applicator License Category # 2 & 10 (VT) and Category C1 (NH)
- American Red Cross First Aid & CPR (2021)
- Game of Logging 1 & 2
- Proficient with the following computer programs: Excel, PowerPoint, Microsoft Word, Arc GIS, NED I, NED II, and other Microsoft Office programs.
- I am eighth generation on my family farm in Wilder Vermont.

EDUCATION

- Master of Science**, Environmental Humanities || University of Utah 2021
Thesis: *Albion Basin: A Case Study of Ecological Restoration in the Anthropocene*
- Graduate Certificate**, Global Sustainability || University of Utah 2020
- Dual Bachelor of Science**, Environmental Science and Geography || SUNY Oneonta 2017

EXPERIENCE

- Stewardship Director**, Cottonwood Canyons Foundation 2021-2023
- Secured grants from Utah Department of Agriculture, local governments, and corporate sponsors
 - Coordinated the Invasive Weeds Management Program
 - Organized large volunteer events including National Public Lands Day and National Trails Day
 - Completed vegetation surveys for NEPA permitting applications relating to new trail construction
 - Hired, trained, and supervised 4 seasonal crew members and over 120 volunteers
 - Led snowshoe and ski field trips focused on ecological education for school groups
- Environmental Humanities Graduate Fellow**, University of Utah 2019-2021
- Assisted in event coordination in 2019, including green lunches and notable guest speakers
 - Contacted prospective students who express interest in applying to the EH program
- Vegetation Monitoring and Assessment Team**, National Park Service, Moab, UT 2019
- Worked to restore native species and eradicate invasives in Canyonlands and Arches National Parks and Hovenweep/Natural Bridges National Monuments in riparian and grassland areas
- AmeriCorps Vista Member**, Mālama Kauaʻi, Kilauea, HI 2018
- Streamlined grant application and management practices and secured grants
 - Developed training materials and provided ongoing mentorship for 8 AmeriCorps members
- Environmental Educator**, NYS Dept. of Environmental Conservation, Delmar, NY 2017
- Developed 8 new educational programs including Beaver Lodges and Bird Adaptations
 - Conducted routine invasive species removal of water chestnut and checks of 10 mile trail network
 - Led High School research class of 12 students monitoring macroinvertebrates
- Environmental Educator**, The Wild Center, Tupper Lake, NY 2016
- Developed and implemented 6 new Live Animal programs
 - Led Canoe and Stand Up Paddleboard tours, educating guests about river ecology and bog species
 - Guided Green Technology tours explaining the functions of photovoltaic cells, biofiltration, pellet stove.

Training

- Utah State Noxious Weed Management Conference, St. George. (2023)
- Utah Master Naturalist: Utah State University (2022)
- Utah State Non-commercial Pesticide Applicators License: (2021)
- *QuickBooks* for Agriculture: Kauai Community College (2018)
- Federal Grant Writing for Nonprofits: NOAA Pacific Region (2018)
- Wilderness First Aid (WFA): National Outdoor Leadership School (2017)
- Early Childhood Educator Facilitator Training: Project Learning Tree (2017)
- Teachers on the Estuary Certified: NOAA (2017)
- Certified Interpretive Guide: National Association for Interpretation (2016)

EDUCATION

- The University of British Columbia, Vancouver, BC** **2019**
Bachelor of Science in Global Resource Systems (B.Sc), Honors Standing
 Thesis: *Soil Carbon Sequestration for British Columbia Vegetable Production*
- The University of Vermont, Burlington, VT** **2023**
 Geographic Information Systems and Data Communication Professional Certificate

EXPERIENCE

- Vermont Fish & Wildlife Department, Montpelier, VT** *Technician* **2023**
- Conducted field work to monitor fish populations in ponds and streams.
 - Created and used surveys to monitor stream banks, tree plantings, culverts, and dams.
 - Synthesized extensive data sets.
 - Created a GIS project to assess aquatic habitat quality.
 - Supported a land acquisition project.
- New Leaf Organics, Bristol, VT** *Crew Lead* **2022**
- Assisted in running a 5-acre flower and vegetable farm.
 - Primary tractor operator.
 - Cover crop manager.
 - Field crew supervisor.
- Pumpkin Village Foods, Burlington, VT** *Sales / Operations* **2020-2022**
- Operated sales, purchasing, accounting, and delivery for the VT branch of a local food distributor.
 - Facilitated significant growth in sales and range of distribution.
- Lamoille South Supervisory Union, Stowe, VT** *Nordic Ski Coach* **2021-2022**
- Laughing Crow Organics, Pemberton, BC** *Field Crew* **2019**

Training

- UVM Soil Morphology (Fall 2021)
- UVM Pasture Management (Fall 2021)

Skills

- ArcGIS Pro / Survey123
- Excel / Data Management
- Google Workspace
- Quickbooks Online
- Soils Identification
- Basic Carpentry

Strategic Woody Addition Final Design Budget

		Units	Rate	Total
1	FWR staff time	30	\$ 38.40	\$ 1,152
2	Mileage	140	\$ 0.655	\$ 92
3	Redstart Contract	1	\$ 16,335	\$ 16,335
	<i>a. Stakeholder and regulator meetings</i> <i>b. Measurement and documentation of stream incision and abandoned floodplain along planned SWA areas</i> <i>c. VDHP Review Requests Submitted</i> <i>d. Complete permitting</i>			
	<i>subtotal</i>			\$ 17,579
4	Indirect			\$ 1,758
	TOTAL			\$ 19,337

1. Staff time estimate based on past design projects, and actual wage rate including fringe. Estimates one visit to each site, 2 meetings, grant administration
2. Mileage estimate based on distance from FWR office to project sites.
3. Based on estimate provided by Redstart
4. De minimis indirect rate of 10%

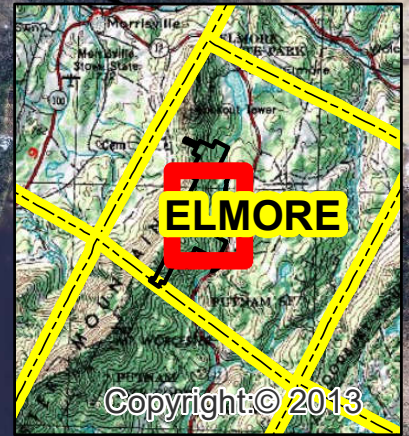
Project 1

North Branch Winooski Rocky Woods Strategic Wood Additions - Elmore

STRATEGIC WOOD ADDITIONS MAP
FOR PROPERTY BELONGING TO

Rocky Woods Investments II LLC

in Elmore, Vermont



North Branch Winooski Trib 6 S1

North Branch Winooski Trib 6 S2

North Branch Winooski Trib 6 S3

North Branch Winooski Trib 7

North Branch Winooski Trib 6 S4

Total length of planned SWA: 1.98 miles

Total area floodplain planned for re-connection: 7.85 acres

Legend

- Planned SWA Areas
- RW_friends_floodplainaccess
- ▭ Parcel Boundary

Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400

This map was created from the Town tax maps,
handheld GPS points, and on the ground observations.

THIS IS NOT A SURVEY

1:15,000

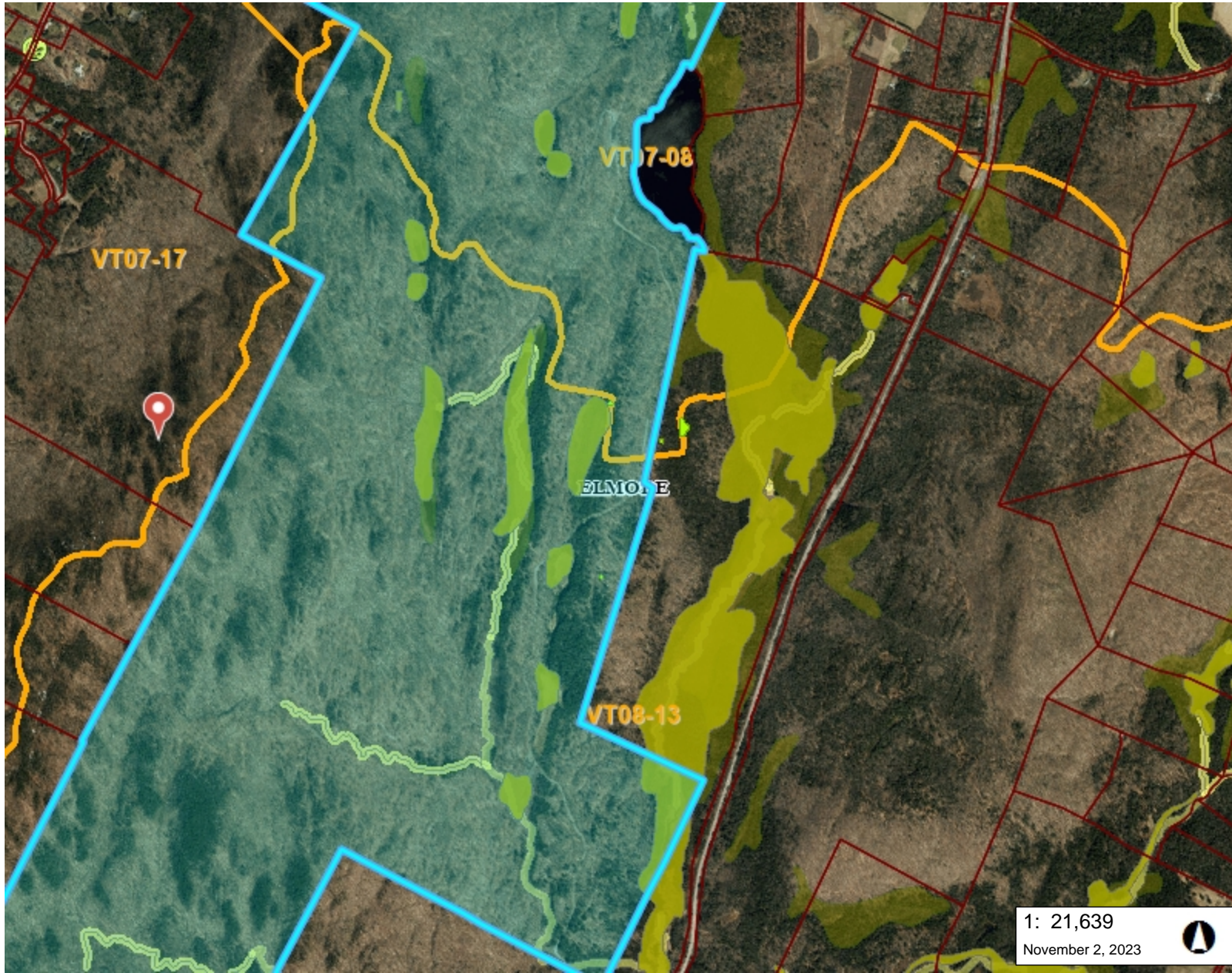


0.3 Miles
1 inch = 1,250 feet

Map Created By: Redstart
October 2023



VCGI



LEGEND

- Wetland - VSWI
 - Class 1 Wetland
 - Class 2 Wetland
 - Wetland Buffer
- Wetlands Advisory Layer
- River Main Stem Waterbodies
- WBID Watersheds
- Flood Hazard Areas (Only FEM)
 - AE (1-percent annual chance flood)
 - A (1-percent annual chance floodpl.)
 - AO (1-percent annual chance zone feet)
 - 0.2-percent annual chance flood ha
- River Corridors (Aug 27, 2019)
 - .5 - 2 sqmi.
 - .25-.5 sqmi.
- Soils - Hydric
- Parcels (standardized)
- ACT250 Permits
- Town Boundary

1: 21,639
November 2, 2023

1,099.0 0 550.00 1,099.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 1803 Ft. 1cm = 216 Meters
© Vermont Agency of Natural Resources THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

NOTES

Map for CWIP project screening created using ANR's Natural Resources Atlas

Strategic Wood Additions (SWA) Inventory																
Landowner Name:			Rocky Woods Investments			Inventory Date:			2/20/2023			See SWA Inventory Sheet Read Me for more information on each Column Heading				
Town:			Elmore			Planner Name:			Redstart							
Stream Name	Downstream Lat/Long	Upstream Lat/Long	Stream Order	Watershed Size (ac.)	Segment Length (ft)	Bankfull Width (ft)	Stream Slope %	Bed - Sediment (e.g. sand)	Existing Wood in Stream pcs/100'	Distance to Downstream X-ing Structures (ft)	Type/ Size of X-ing Structure	Brook Trout Present	Suitable Tree Cover (Y/N)	Total added wood in coarse sized pieces	Detailed Work Plan	
1	North Branch Winooski River Trib 6 S1	44.495643, -72.543183	44.498691, -72.545288	1	46	1,351	4	7%	cobble/gravel	<1	>1 mile	Logging road bank-spanning iron bridge	unknown	Y	54	18-27 channel spanning structures located strategically at points where floodplain can become engaged during high flow events, and where wood can significantly reduce channel incision over time. 2-3 pieces CWM per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>14" diameter) secured across banks every 300' and at downstream end.
2	North Branch Winooski River Trib 6 S2	44.490255, -72.542178	44.492448, -72.542523	1	147	868	6	4%	cobble	<1	>1 mile	Logging road bank-spanning iron bridge	unknown	Y	35	12-18 channel spanning structures located strategically at points where floodplain can become engaged during high flow events, and where wood can significantly reduce channel incision over time. 2-3 pieces CWM per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>14" diameter) secured across banks every 300' and at downstream end.
3	North Branch Winooski River Trib 6 S3	44.492056, -72.538421	44.490421, -72.541334	1	250	1,237	10	7%	cobble/boulder	<1	>1 mile	Logging road bank-spanning iron bridge	unknown	Y	49	12-16 channel spanning structures located strategically at points where floodplain can become engaged during high flow events, and where wood can significantly reduce channel incision over time. 3-4 pieces CWM per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>14" diameter) secured across banks every 300' and at downstream end.
4	North Branch Winooski River Trib 6 S4	44.47273, -72.53741	44.485633, -72.538895	2	800	5,891	12	5%	cobble	<1	300 ft	Logging road bank-spanning iron bridge	unknown	Y	236	48-78 channel spanning structures located strategically at points where floodplain can become engaged during high flow events, and where wood can significantly reduce channel incision over time. 3-5 pieces CWM per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>14" diameter) secured across banks every 300' and at downstream end.
5	North Branch Winooski River Trib 7	44.481036, -72.540044	44.483482, -72.541634	1	70	1,104	6	6%	cobble	<1	4,000 ft	Logging road bank-spanning iron bridge	unknown	Y	44	15-22 channel spanning structures located strategically at points where floodplain can become engaged during high flow events, and where wood can significantly reduce channel incision over time. 2-3 pieces CWM per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>14" diameter) secured across banks every 300' and at downstream end.

North Branch Winooski River Rocky Woods Strategic Wood Additions

Pre-Implementation Documentation

Site Visit by James King, 2/20/2023

North Branch Winooski Tributary 5, Segment 1: This stream begins as 1st order flowing south alongside one of this property's rocky outcrops. It flows through several beaver-impacted areas, some which are active and others which have turned to meadow. This is why the stream is segmented into areas appropriate for SWA restoration. The stream is shaded entirely by northern hardwood forest with a component of red spruce in of outcrop areas that it passes by. Between outcrops there are excellent floodplain areas that should be re-engaged by adding coarse wood materials. The upper extent of the planned stream restoration is located where the channel reaches appropriate size and form to benefit from SWA. The downstream end is before the edge of a beaver-impacted area. Total length: 1,351 ft. See SWA Inventory Sheet for more details.



(Top left: looking downstream along Trib 6 S1 from the upper extent of the restoration area; top right: looking upstream at Trib 6 S1 approaches the first beaver area.)

North Branch Winooski River Tributary 6 Segment 2: This 1st- order stream flows south above between rocky outcrops. The riparian forest is northern hardwoods-red spruce. There are some nice areas for floodplain engagement along this stream. Both the upper and lower extents of the planned stream restoration are located outside of where the stream becomes impacted by beavers. Total length: 868 ft. See SWA Inventory Sheet for more details.



(Top left: looking downstream along Trib 6 S2 from the upper extent of the restoration area; Right: looking upstream at the reach from the downstream extent of the restoration area; Bottom left: looking at a floodplain area along the reach that will become better connected to the stream because of SWA.)

North Branch Winooski River Tributary 6 Segment 3: This continuation of the 1st order tributary flows to the northeast as it and navigates the ledged topography. Both the upper and lower extents of the planned stream restoration are located outside where the stream becomes impacted by beavers. This stream passes through some excellent floodplain that may have once been a beaver meadow, but it is lacking the structural roughness throughout the channel from wood that is needed to sufficiently engage the floodplains during high-flow events. The riparian forest is a mix of northern hardwoods and red spruce/hemlock. Total length: 1,237 ft. See SWA Inventory Sheet for further details.,



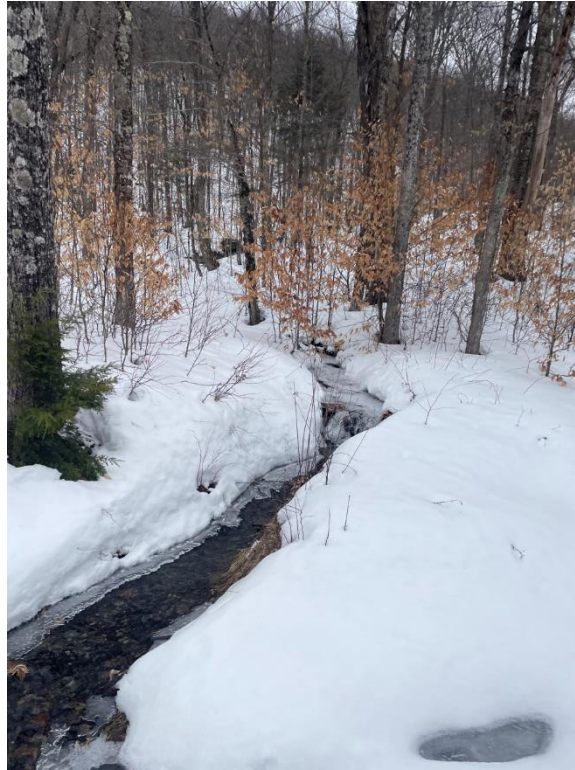
(Top left: looking downstream along Trib 3 from the upper extent of the restoration area; Right: looking upstream at Trib 3 from the bottom of the restoration area; Bottom left: Looking upstream along a floodplain area where the stream can be reconnected for long-term nutrient and sediment storage.)

North Branch Winooski River Tributary 6 Segment 4: This 2st order stream flows south through much of the property and is its longest stream segment. It passes between rough rocky ledges, and through gentle meadows and forested floodplains areas. The riparian forest is mixed woods primarily with a northern hardwoods component as well as lots of hemlock. The upper extent of the restoration area is located in a meadow where the channel reaches suitable form to benefit from SWA. The lower extent of the restoration area is located 300 ft upstream from a bridge along a private gravel road that is used to access the property from the southeastern corner. Total length: 5,891 ft. See SWA Inventory Sheet for more details.



(Top left: looking downstream along Trib 6 S4 from the upper extent of the restoration area; Right: looking upstream at Trib 6 S4 from the lower extent of the restoration area; Bottom left: looking at a large forested floodplain area from the north.)

North Branch Winooski River Tributary 7: This 1st order stream flows south in the central area of the property. It is shaded by mixed northern hardwoods hemlock forest. Other 1st order and intermittent drainages connect to this stream, and some of them are quite steep. Lots of sediment is mobilized into these drainages and SWA will help to capture sediment in and along this lower gradient stream at the bottom of the network. The upstream extent of the restoration area is at the bottom of a forested seep where the channel becomes of suitable size and form to benefit from SWA, and the lower extent of the restoration area is located where the stream joins with Trib 6 S4. Total length: 1,104 ft. See SWA inventory sheet for more details.



(Top left: looking downstream along Trib 7 from the upper extent of the restoration area; Right: looking upstream at Trib 7 from the bottom of the restoration area; Bottom left: Looking downstream along a floodplain area where the stream SWA can help fulfill long-term nutrient and sediment storage. The stream lacks the wood and fine sediment here that is needed for these important functions.)

FFI – Tool Calculations for N. Branch Winooski Rocky Woods Strategic Wood Additions – Final Design

The project takes place in headwater streams that do not always overlap completely with the river corridor units shown by the FFI. Mapped floodplain areas that are planned for restored connectivity as a result of the SWA implementation are input to the nearest downstream river corridor unit.

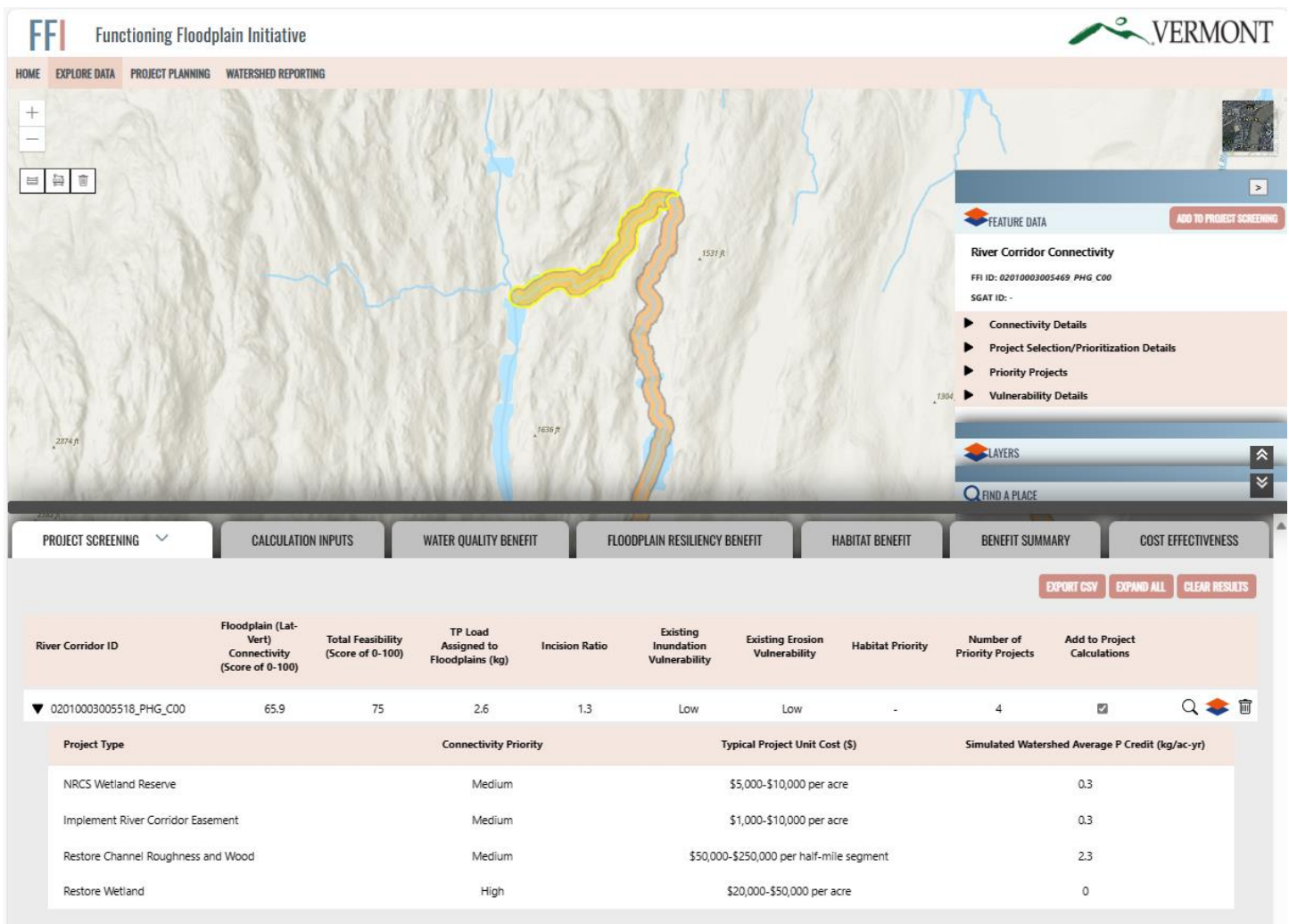
Project totals: 7.85 acres of vertically reconnected floodplain along 1.98 miles of 1st and 2nd order stream.

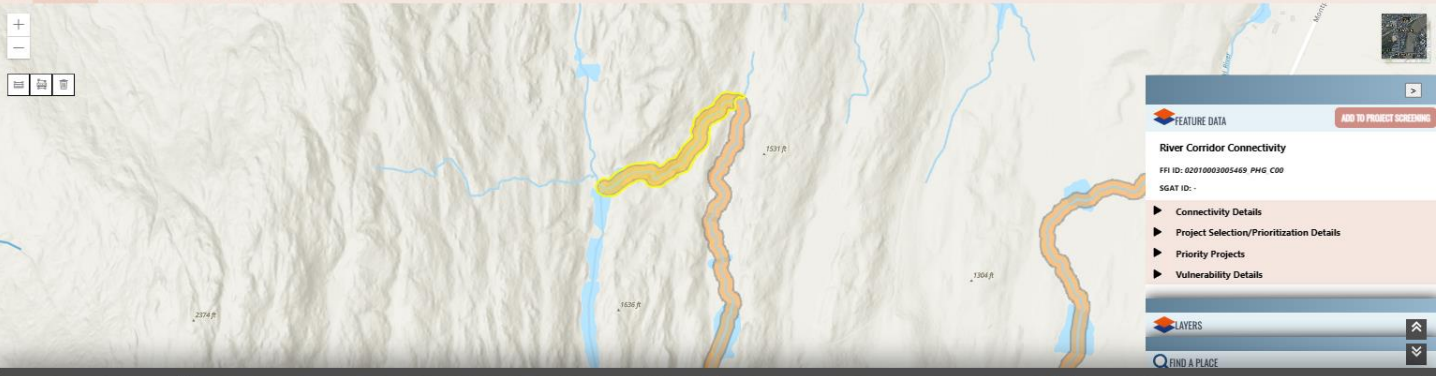
913.6 kg phosphorous avoided over 15 yr project lifespan.

North Branch Winooski Trib 6 Segments 1, 2, and 3 → 02010003005469_PHG_C00

Total area of planned floodplain reconnection: 1.7 acres

Total p-reduction (15 yr lifespan): 123.6 kg





EXPORT CSV CLEAR RESULTS

Enter Proposed Information for Potential Stream Stability Projects Below:

CALCULATE

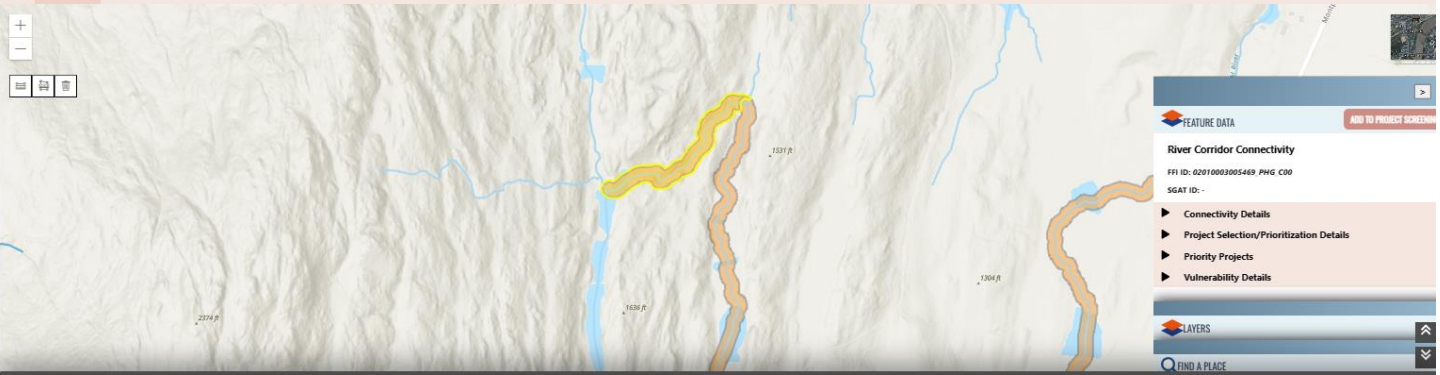
Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Remove Minor Constraint
- Remove Berm
- Plant Floodplain
- Adopt River Corridor Bylaws
- Restore Wetland
- Plant River Corridor
- Create Flood Bench
- Remove Major Constraint
- Reconnect Flood Chute
- Plant 50-Foot Riparian Area
- Implement River Corridor Easement
- NRCS Wetland Reserve
- Raise Channel
- Lower Floodplain
- Restore Channel Roughness and Wood

STREAM STABILITY (FLOODPLAINS)		STORAGE		
River Corridor ID	Existing Reach Connectivity	Project Area Connectivity	Proposed Project Area (acres)	
02010003005518_PHG_C00	Existing Low	-	1.7	
Proposed Project Values		Low	High	

Stream Connectivity (Longitudinal-Temporal) Crediting



EXPORT CSV CLEAR RESULTS

Enter Proposed Information for Potential Stream Stability Projects Below:

CALCULATE

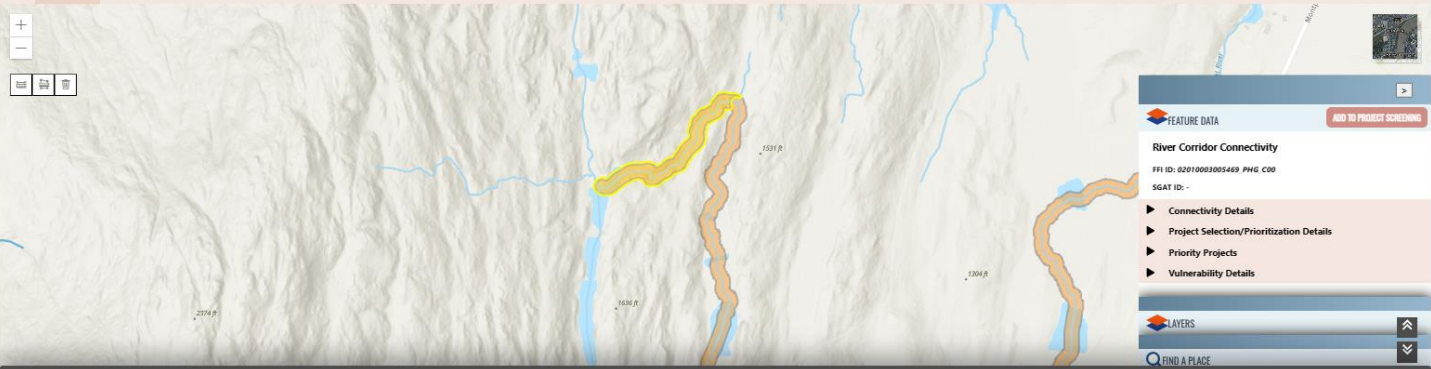
Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Remove Minor Constraint
- Remove Berm
- Plant Floodplain
- Adopt River Corridor Bylaws
- Restore Wetland
- Plant River Corridor
- Create Flood Bench
- Remove Major Constraint
- Reconnect Flood Chute
- Plant 50-Foot Riparian Area
- Implement River Corridor Easement
- NRCS Wetland Reserve
- Raise Channel
- Lower Floodplain
- Restore Channel Roughness and Wood

STREAM STABILITY (FLOODPLAINS)				STORAGE						
River Corridor ID	River 50-ft Corridor Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Low Protections Area (acres)	No Protection Area (acres)	Naturally Vegetated Buffer Area (acres)	Proposed Incision Ratio	Area with Vertical Change (acres)
02010003005518_PHG_C00	Existing 8.9	6.9	1.3	8.9	0	8.9	0	0	8.8	-
Proposed Project Values		-	-	1.3						1.7

Stream Connectivity (Longitudinal-Temporal) Crediting



FEATURE DATA ADD TO PROJECT SCREENING

River Corridor Connectivity
 FFI ID: 02010003005469_PHG_C00
 SGAT ID: -

- ▶ Connectivity Details
- ▶ Project Selection/Prioritization Details
- ▶ Priority Projects
- ▶ Vulnerability Details

LAYERS

FIND A PLACE

Projects Included: Restore Channel Roughness and Wood

Stream Names: -

Project Area (acres): 1.7

Stream Stability and Storage Credit Summary

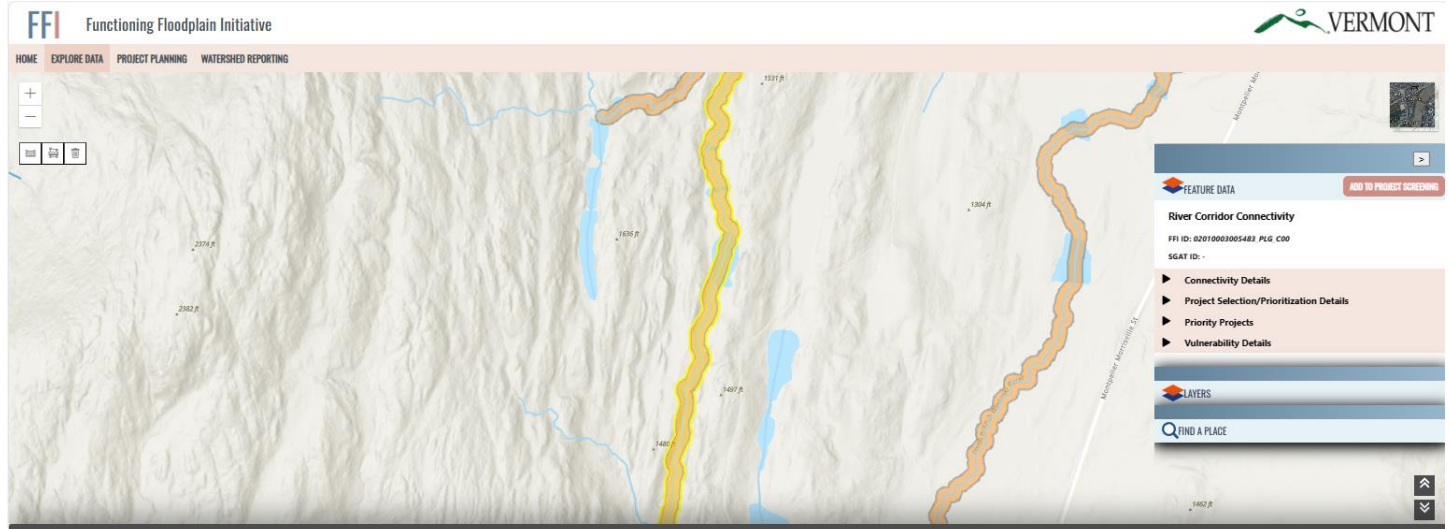
	Year 1 Credit (kg)	Year 2+ Credit (kg/yr)	Estimated 15 Yr Lifespan Credit (kg)
Floodplain Connectivity (Lateral - Vertical)			
Stream Stability	0.0	0.0	0.0
Storage	15.4	7.7	123.5
Stream Connectivity (Longitudinal - Temporal)			
Stream Stability	0.0	0.0	0.0
TOTAL	15.4	7.7	123.5

▼ Stream Stability Credit and Connectivity Details

Floodplain Connectivity (Lateral-Vertical)									
River Corridor ID	Project Connectivity Credit Score	Existing Subunit Floodplain/Corridor Connectivity Score	Proposed Lateral Credit Score	Proposed Vertical Credit Score	Proposed Subunit Floodplain/Connectivity Score	Lateral P Reduction Credit (kg/yr)	Vertical P Reduction Credit (kg/yr)	Total P Reduction Credit (kg/yr)	Total P Reduction Credit (lb/yr)
02010003005518_PHG_C00	-0.1	65.9	0	0	65.8	0	0	0	0
Stream Connectivity (Longitudinal-Temporal)									

Total area of planned floodplain reconnection: 1.8 acres

Total p-reduction (15 yr lifespan): 146.0 kg



Enter Proposed Information for Potential Stream Stability Projects Below: EXPORT CSV CLEAR RESULTS CALCULATE

▼ Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Remove Minor Constraint
- Remove Berm
- Plant Floodplain
- Adopt River Corridor Bylaws
- Restore Wetland
- Plant River Corridor
- Create Flood Bench
- Remove Major Constraint
- Reconnect Flood Chute
- Plant 50-Foot Riparian Area
- Implement River Corridor Easement
- NRCS Wetland Reserve
- Raise Channel
- Lower Floodplain
- Restore Channel Roughness and Wood

River Corridor ID	STREAM STABILITY (FLOODPLAINS)					STORAGE					
	River Corridor Area (acres)	50-ft Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Low Protections Area (acres)	No Protection Area (acres)	Naturally Vegetated Buffer Area (acres)	Proposed Incision Ratio	Area with Vertical Change (acres)
02010003005483_PLG_C00	Existing 11.4	11.4	1.3	11.4	0	11.4	0	0	10.6	-	-
Proposed Project Values	-	-	1.3							1.0	1.7

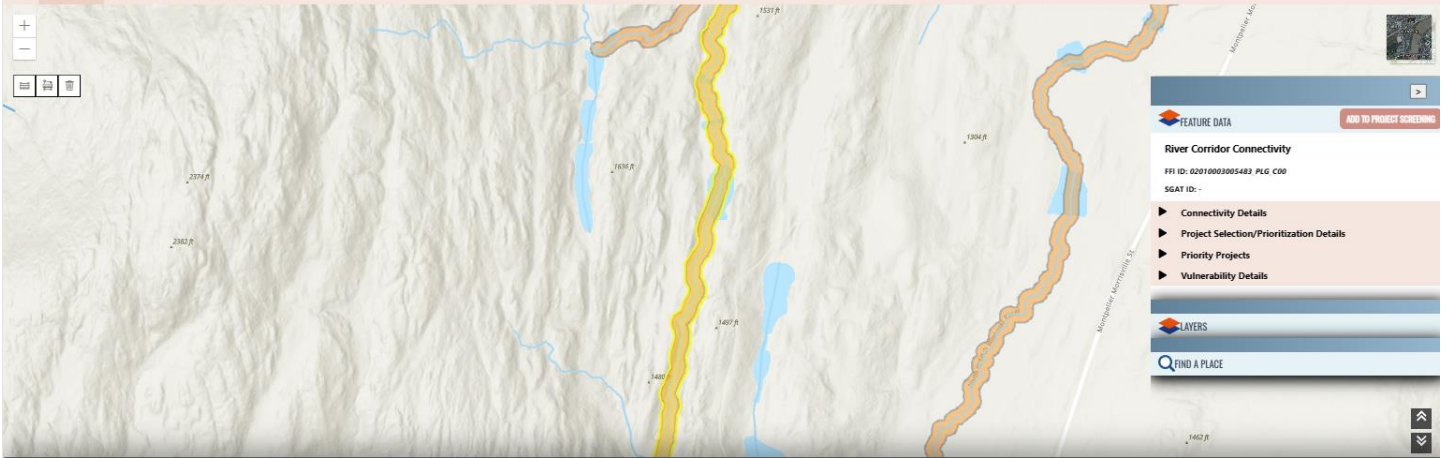
FFI Functioning Floodplain Initiative VERMONT

HOME EXPLORE DATA PROJECT PLANNING WATERSHED REPORTING

PROJECT SCREENING | CALCULATION INPUTS | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

EXPORT CSV EXPAND ALL CLEAR RESULTS

River Corridor ID	Floodplain (Lat-Vert) Connectivity (Score of 0-100)	Total Feasibility (Score of 0-100)	TP Load Assigned to Floodplains (kg)	Incision Ratio	Existing Inundation Vulnerability	Existing Erosion Vulnerability	Habitat Priority	Number of Priority Projects	Add to Project Calculations
▶ 02010003005483_PLG_C00	65.2	100	16.6	1.3	Low	Low	-	4	<input checked="" type="checkbox"/>



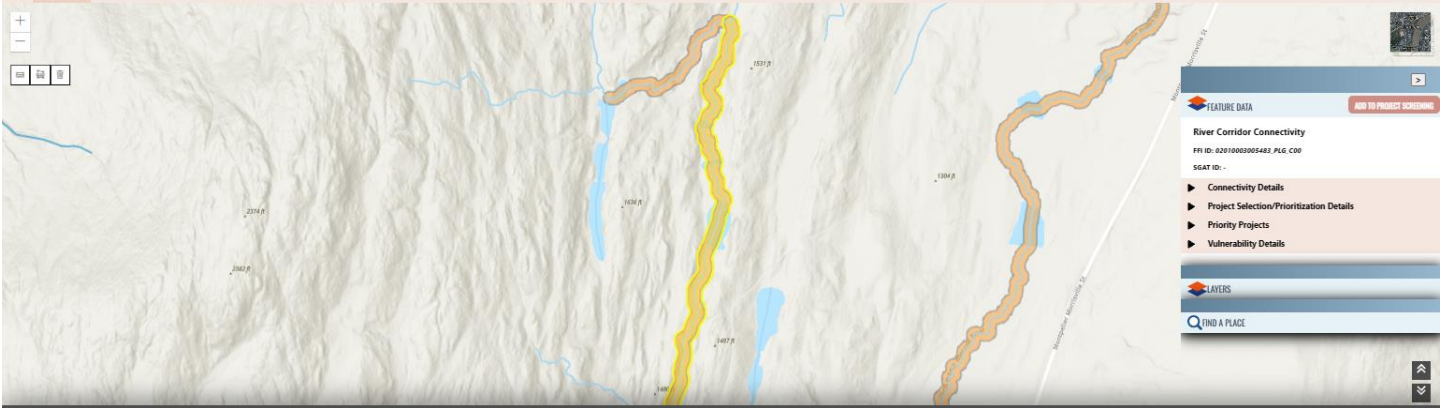
Enter Proposed Information for Potential Stream Stability Projects Below: EXPORT CSV CLEAR RESULTS

Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)	Existing Reach Connectivity	Project Area Connectivity	STORAGE
02010003005483_PLG_C00	Existing	Low	-	-
	Proposed Project Values	Low	High	1.7



Town: ELMORE
 Projects Included: Restore Channel Roughness and Wood
 Stream Names: -
 Project Area (acres): 1.7

Stream Stability and Storage Credit Summary

	Year 1 Credit (kg)	Year 2+ Credit (kg/yr)	Estimated 15 Yr Lifespan Credit (kg)
Floodplain Connectivity (Lateral - Vertical)			
Stream Stability	1.5	1.5	22.5
Storage	15.4	7.7	123.5
Stream Connectivity (Longitudinal - Temporal)			
Stream Stability	0.0	0.0	0.0
TOTAL	16.9	9.2	146.0

Stream Stability Credit and Connectivity Details

Floodplain Connectivity (Lateral-Vertical)									
River Corridor ID	Project Connectivity Credit Score	Existing Subunit Floodplain/Corridor Connectivity Score	Proposed Lateral Credit Score	Proposed Vertical Credit Score	Proposed Subunit Floodplain/Connectivity Score	Lateral P Reduction Credit (kg/yr)	Vertical P Reduction Credit (kg/yr)	Total P Reduction Credit (kg/yr)	Total P Reduction Credit (lb/yr)
02010003005483_PLG_C00	2	65.2	0	0	67.2	0	1.5	1.5	3.2
Stream Connectivity (Longitudinal-Temporal)									

North Branch Winooski Trib 6 Segment middle reach → 02010003000791_PHG_C00

Total area of planned floodplain reconnection: 2.2 acres

Total p-reduction (15 yr lifespan): 165.8 kg

FFI Functioning Floodplain Initiative

HOME EXPLORE DATA PROJECT PLANNING WATERSHED REPORTING

PROJECT SCREENING | **CALCULATION INPUTS** | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

River Corridor ID	Floodplain (Lat-Vert) Connectivity (Score of 0-100)	Total Feasibility (Score of 0-100)	TP Load Assigned to Floodplains (kg)	Incision Ratio	Existing Inundation Vulnerability	Existing Erosion Vulnerability	Habitat Priority	Number of Priority Projects	Add to Project Calculations
02010003000791_PHG_C00	63.6	100	0.7	1.3	Low	Low	-	1	<input type="checkbox"/>

Enter Proposed Information for Potential Stream Stability Projects Below: **CALCULATE**

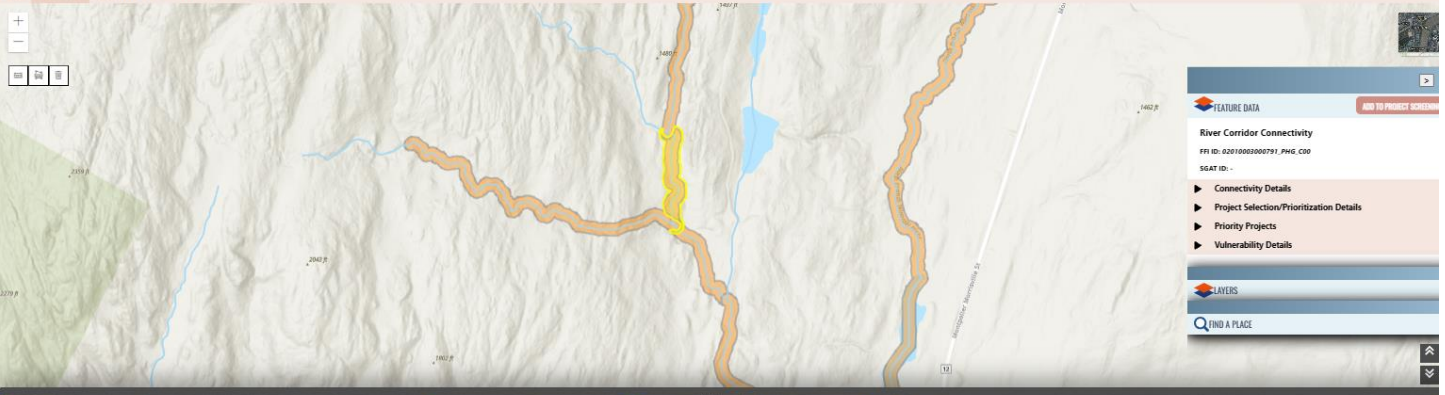
Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)			STORAGE							
	River Corridor Area (acres)	50-ft Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Low Protections Area (acres)	No Protection Area (acres)	Naturally Vegetated Buffer Area (acres)	Proposed Incision Ratio	Area with Vertical Change (acres)
02010003000791_PHG_C00	Existing 2.3	2.3	1.3	2.3	0	2.3	0	0	1.8	-	-
	Proposed Project Values	-	-	1.3						1.0	2.2

Stream Connectivity (Longitudinal-Temporal) Crediting



FEATURE DATA ADD TO PROJECT SCREENING

River Corridor Connectivity
 FFI ID: 02010003000791_PHG_C00
 SGAT ID: -

- ▶ Connectivity Details
- ▶ Project Selection/Prioritization Details
- ▶ Priority Projects
- ▶ Vulnerability Details

LAYERS

FIND A PLACE

PROJECT SCREENING | CALCULATION INPUTS | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

EXPORT CSV CLEAR RESULTS CALCULATE

Enter Proposed Information for Potential Stream Stability Projects Below:

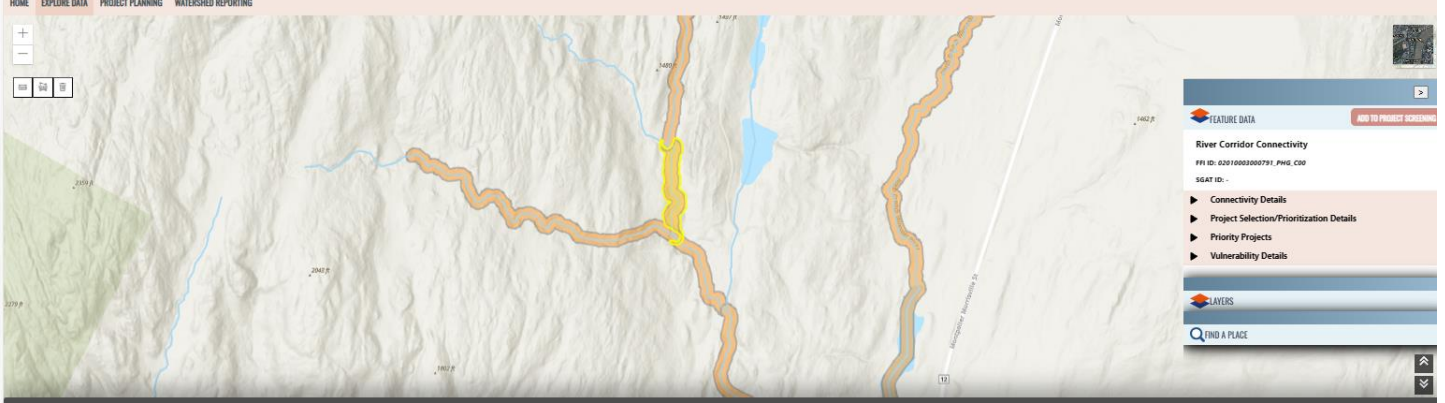
▼ Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

STREAM STABILITY (FLOODPLAINS)		STORAGE	
River Corridor ID	Existing Reach Connectivity	Project Area Connectivity	Proposed Project Area (acres)
02010003000791_PHG_C00	Existing: Low	High	2.2
	Proposed Project Values		

▶ Stream Connectivity (Longitudinal-Temporal) Crediting



FEATURE DATA ADD TO PROJECT SCREENING

River Corridor Connectivity
 FFI ID: 02010003000791_PHG_C00
 SGAT ID: -

- ▶ Connectivity Details
- ▶ Project Selection/Prioritization Details
- ▶ Priority Projects
- ▶ Vulnerability Details

LAYERS

FIND A PLACE

SubUnit(s) ID: 02010003000791_PHG_C00
 Town: ELMORE
 Projects Included: Restore Channel Roughness and Wood
 Stream Names: -
 Project Area (acres): 2.2

Stream Stability and Storage Credit Summary

	Year 1 Credit (kg)	Year 2+ Credit (kg/yr)	Estimated 15 Yr Lifespan Credit (kg)
Floodplain Connectivity (Lateral - Vertical)			
Stream Stability	0.4	0.4	6.0
Storage	20.0	10.0	159.8
Stream Connectivity (Longitudinal - Temporal)			
Stream Stability	0.0	0.0	0.0
TOTAL	20.4	10.4	165.8

▼ Stream Stability Credit and Connectivity Details

Floodplain Connectivity (Lateral-Vertical)									
River Corridor ID	Project Connectivity Credit Score	Existing Subunit Floodplain/Corridor Connectivity Score	Proposed Lateral Credit Score	Proposed Vertical Credit Score	Proposed Subunit Floodplain/Connectivity Score	Lateral P Reduction Credit (kg/yr)	Vertical P Reduction Credit (kg/yr)	Total P Reduction Credit (kg/yr)	Total P Reduction Credit (lb/yr)
02010003000791_PHG_C00	15.3	63.6	0	0.2	78.9	0	0.4	0.4	0.9

Stream Connectivity (Longitudinal-Temporal)

North Branch Winooski Trib 6 Segment 4 lower reach → 02010003005518_PHG_C00

Total area Total area of planned floodplain reconnection: 2.15 acres

Total p-reduction (15 yr lifespan): 478.2 kg

River Corridor ID	Floodplain (Lat-Vert) Connectivity (Score of 0-100)	Total Feasibility (Score of 0-100)	TP Load Assigned to Floodplains (kg)	Incision Ratio	Existing Inundation Vulnerability	Existing Erosion Vulnerability	Habitat Priority	Number of Priority Projects	Add to Project Calculations
02010003005518_PHG_C00	65.9	75	2.6	1.3	Low	Low	-	4	<input type="checkbox"/>

Enter Proposed Information for Potential Stream Stability Projects Below: CALCULATE

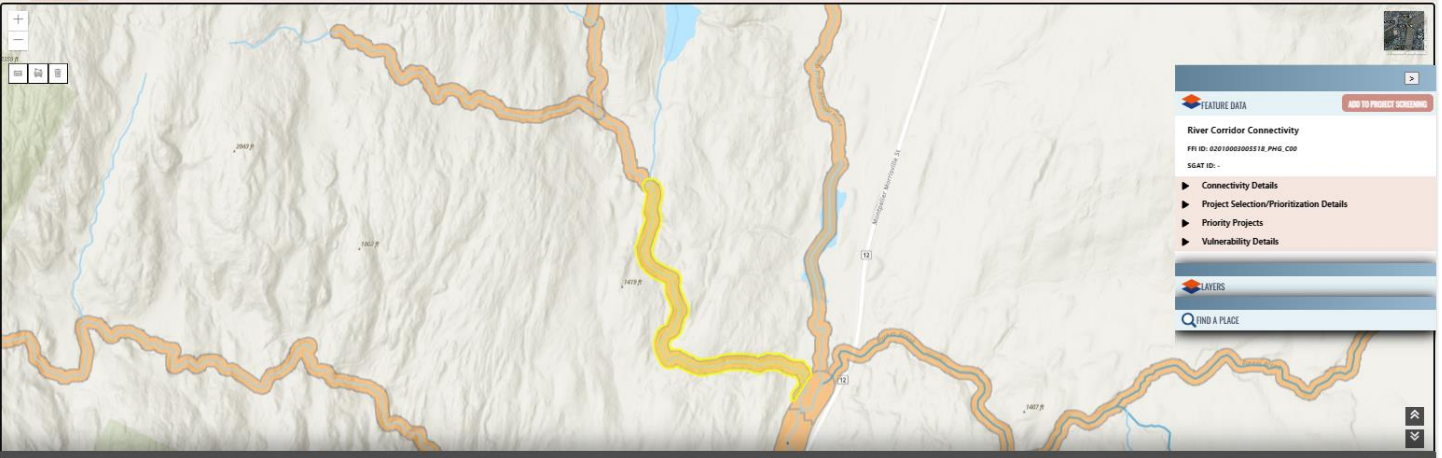
▼ Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)				STORAGE						
	River Corridor Area (acres)	50-ft Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Low Protections Area (acres)	No Protection Area (acres)	Naturally Vegetated Buffer Area (acres)	Proposed Incision Ratio	Area with Vertical Change (acres)
02010003005518_PHG_C00	Existing 8.9	8.9	1.3	8.9	0	8.9	0	0	8.8	-	-
	Proposed Project Values	-	-	<input type="text" value="1.3"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text" value="1.0"/>	<input type="text" value="2.15"/>

► Stream Connectivity (Longitudinal-Temporal) Crediting



PROJECT SCREENING | CALCULATION INPUTS | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

Enter Proposed Information for Potential Stream Stability Projects Below: EXPORT CSV CLEAR RESULTS CALCULATE

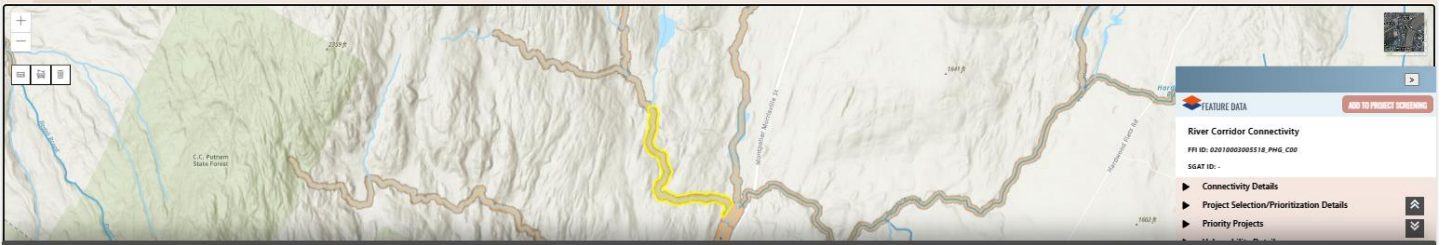
Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

STREAM STABILITY (FLOODPLAINS)	Existing Reach Connectivity	Project Area Connectivity	STORAGE	Proposed Project Area (acres)
River Corridor ID: 02010003005518_PHG_C00	Existing: Low	Proposed Project Values: Low	High	2.15

Stream Connectivity (Longitudinal-Temporal) Crediting



PROJECT SCREENING | CALCULATION INPUTS | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

Estimated Phosphorus Credit for Stream Stability and Storage EXPORT CSV

SubUnits ID: 02010003005518_PHG_C00
 Town: ELMORE
 Projects Included: Restore Channel Roughness and Wood
 Stream Names: -
 Project Area (acres): 2.15

Stream Stability and Storage Credit Summary

	Year 1 Credit (kg)	Year 2+ Credit (kg/yr)	Estimated 15 Yr Lifespan Credit (kg)
Floodplain Connectivity (Lateral - Vertical)			
Stream Stability	0.4	0.4	6.0
Storage	59.0	29.6	472.2
Stream Connectivity (Longitudinal - Temporal)			
Stream Stability	0.0	0.0	0.0
TOTAL	59.4	30.0	478.2

Stream Stability Credit and Connectivity Details

Floodplain Connectivity (Lateral-Vertical)									
River Corridor ID	Project Connectivity Credit Score	Existing Subunit Floodplain/Corridor Connectivity Score	Proposed Lateral Credit Score	Proposed Vertical Credit Score	Proposed Subunit Floodplain/Connectivity Score	Lateral P Reduction Credit (kg/yr)	Vertical P Reduction Credit (kg/yr)	Total P Reduction Credit (kg/yr)	Total P Reduction Credit (lb/yr)
02010003005518_PHG_C00	3.3	65.9	0	0.1	69.2	0	0.4	0.4	0.8

Stream Connectivity (Longitudinal-Temporal)

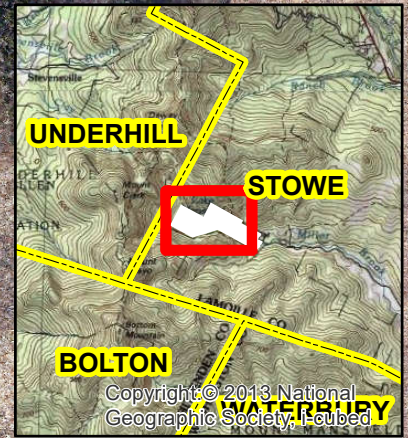
Project 2

Lake Mansfield Headwaters Strategic Wood Additions - Stowe

STRATEGIC WOOD ADDITIONS MAP
FOR PROPERTY BELONGING TO

Lake Mansfield Trout Club

in Stowe, Vermont



Lake Mansfield Trib 5

Lake Mansfield Trib 4

Lake Mansfield Trib 3

Lake Mansfield Trib 2

Lake Mansfield Trib 1

Lake Mansfield Trib 6

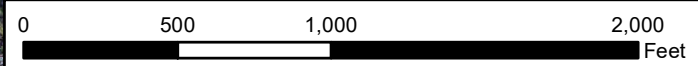
Miller Brook Trib 1

NEBRASKA VALLEY RD

Legend

- Planned SWA Areas
- Planned Areas for Floodplain Connectivity
- Town Road
- Parcel Boundary

Total planned length of restored stream: 2,825 ft
Total planned area of re connected floodplain: 0.9 acres



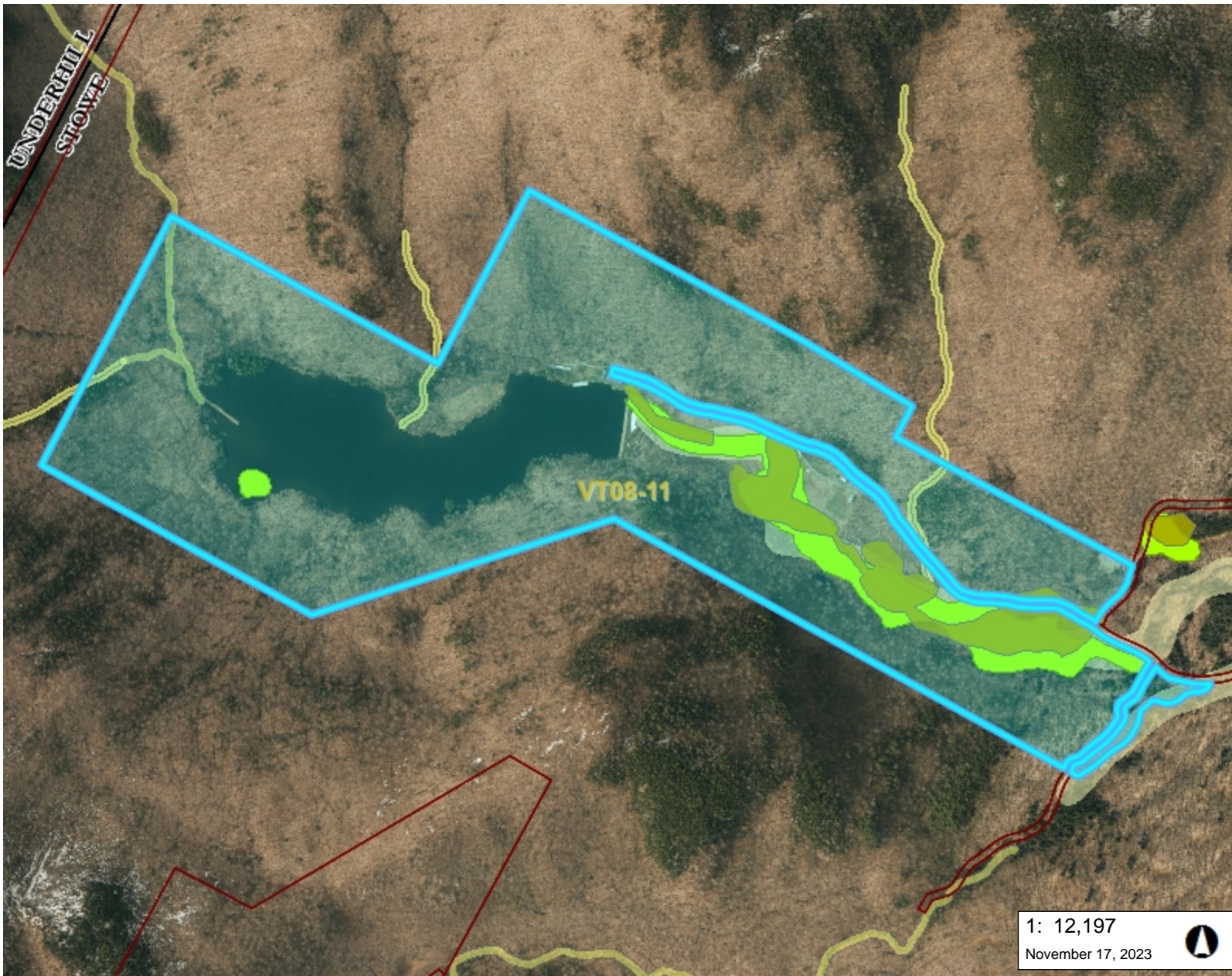
Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400
This map was created from the Town tax maps,
handheld GPS points, and on the ground observations.
THIS IS NOT A SURVEY



1 inch = 625 feet

Map Created By: Redstart
10/2023





LEGEND

- Wetland - VSWI**
 - Class 1 Wetland
 - Class 2 Wetland
 - Wetland Buffer
- Wetlands Advisory Layer
- River Main Stem Waterbodies
- WBID Watersheds
- Flood Hazard Areas (Only FEM)**
 - AE (1-percent annual chance floodpl.)
 - A (1-percent annual chance floodpl.)
 - AO (1-percent annual chance zone feet)
 - 0.2-percent annual chance flood ha
- River Corridors (Aug 27, 2019)
 - .5 - 2 sqmi.
 - .25-.5 sqmi.
- Soils - Hydric
- Parcels (standardized)
- ACT250 Permits
- Town Boundary

1: 12,197
November 17, 2023

NOTES

Project Screening Map created using ANR's Natural Resources Atlas

620.0 0 310.00 620.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 1016 Ft. 1cm = 122 Meters

© Vermont Agency of Natural Resources THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

Strategic Wood Additions (SWA) Inventory																
Landowner Name:			Lake Mansfield Trout Club			Inventory Date:			2/21/2023			See SWA Inventory Sheet Read Me for more information on each Column Heading				
Town:			Stowe			Planner Name:			Redstart							
Stream Name	Downstream Lat/Long	Upstream Lat/Long	Stream Order	Watershed Size (ac.)	Segment Length (ft)	Bankfull Width (ft)	Stream Slope %	Bed - Sediment (e.g. sand)	Existing Wood in Stream pcs/100'	Distance to Downstream X-ing Structures (ft)	Type/ Size of X-ing Structure	Brook Trout Present	Suitable Tree Cover (Y/N)	Total Added Wood in Coarse sized pieces	Detailed Work Plan	
1	Lake Mansfield Trib 1	44.471057, -72.820519	44.471347, -72.822202	1	60	481	6	4%	cobble	1	3,100 ft	Wood bank-spanning footbridge	unknown	Y	19	6-9 channel-spanning structures. 2-3 pieces of coarse wood material per structure. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>8" diameter) secured across banks every 300' and at downstream end. Downstream end at approach to Lake Mansfield.
2	Lake Mansfield Trib 2	44.472108, -72.821692	44.472084, -72.822556	1	16	247	5	4%	cobble	<1	50 ft	Wood bank-spanning footbridge	unknown	Y	10	3-4 channel-spanning structures. 2-3 pieces of coarse wood material per structure. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>8" diameter) secured across at downstream end. Downstream end at safe distance from private bridge.
3	Lake Mansfield Trib 3	44.473049, -72.821677	44.472891, -72.822756	1	9	322	4	4%	cobble/gravel	2	2,800 ft	Wood bank-spanning footbridge	unknown	Y	13	4-6 channel-spanning structures. 2-3 pieces of coarse wood material per structure. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>8" diameter) secured across d at downstream end. Downstream end at approach to Lake Mansfield.
4	Lake Mansfield Trib 4	44.473937, -72.821968	44.473245, -72.823687	2	512	540	7	6%	cobble	1	50 ft	Wood bank-spanning footbridge	unknown	Y	22	7-11 channel-spanning structures. 2-3 pieces of coarse wood material per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>10" diameter) secured across banks every 300' and at downstream end. Downstream end at safe distance from private bridge.
5	Lake Mansfield Trib 5	44.474034, -72.821847	44.45471, -72.821914	2	531	764	15	4%	cobble	<1	50 ft	Wood bank-spanning footbridge	unknown	Y	31	6-9 channel spanning structures or partially channel-spanning structures, depending on size of available trees. 4-6 pieces per structure. Additional fine wood materials placed in structures to accelerate sediment capture. Double-strainer (>10" diameter) secured across banks every 300' and at downstream end. Downstream end at property boundary.
6	Lake Mansfield Trib 6	44.472744, -72.81548	44.473311, -72.815251	1	192	235	10	7%	cobble	1.5	50 ft	Wood bank-spanning footbridge	unknown	Y	9	2-3 channel-spanning structures. 3-5 pieces of coarse wood material per structure. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>12" diameter) secured across banks at downstream end. Downstream end at safe distance from private bridge.
7	Miller Brook Trib 1	44.4694, -72.803202	44.469947, -72.80313	2	269	236	12	5%	cobble	1	200 ft	concrete dam	unknown	Y	9	2-3 channel-spanning structures. 3-5 pieces of coarse wood material per structure. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>12" diameter) secured across banks at downstream end. Downstream end at safe distance from private bridge.

Lake Mansfield Headwaters Strategic Wood Additions

Pre implementation documentation

Lake Mansfield Tributary 1: This 1st order tributary flows east from the base of a steep hillside to the western edge of Lake Mansfield. It is shaded by northern hardwood forest cover. The restoration area ends just beyond an unconverted woods road stream crossing. Total length: 481 ft. See SWA inventory Sheet for more details.



(Left: Looking upstream from where Lake Mansfield Trib 1 ends just beyond a woods road, before reaching the lake;
Right: looking downstream from where the stream restoration area begins as it becomes of suitable size, structure, and slope for SWA.)

Lake Mansfield Tributaries 2 and 3: Lake Mansfield Trib 2 is a 1st order tributary that flows east from the base of a steep hillside to the western edge of Lake Mansfield. It is shaded by northern hardwood forest cover. The restoration area ends 50 ft before the stream is crossed by a wooden footbridge. Total length: 247 ft. Lake Mansfield Trib 3 is similarly a 1st order stream flowing east, ending close to where it reaches the western edge of Lake Mansfield. Total length: 322 ft. See SWA inventory Sheet for more details.



(Top left:
looking
upstream at
Lake Mansfield
Trib 1 before it
near the
wooden
footbridge

Top right:
looking
downstream
Lake Mansfield
Trib 2 from the
upper extent of
the planned
restoration,

Bottom left:
looking
upstream Lake
Mansfield Trib 3
before it nears
the lake.

Bottom right:
looking
downstream at
Lake Mansfield
Trib 3 as it
becomes of
adequate size
and structure to
begin SWA
restoration.

Lake Mansfield Tributaries 4 and 5: Lake Mansfield Trib 4 is 2nd order stream that flows west to the western edge of Lake Mansfield. Planned restoration begins upstream where the stream crosses the western border of the property. It is joined by a first order stream from the north shortly thereafter, though this stream is too steep to include in the restoration plan. It flows through mixed wood forest cover, and the restoration area ends just before it joins with Trib 5 and passes under a wooden footbridge. Total length: 540 ft. Lake Mansfield Trib 5 is similarly a 2nd order stream that enters the property near its northwestern corner, then flows southeast. Planned restoration ends just before it joins with Trib 4 and passes under a wooden footbridge. Total length: 764 ft. See SWA inventory sheet for more details.



(Top left: looking upstream at Lake Mansfield Trib 4 before it near the wooden footbridge

Top right: looking upstream at Lake Mansfield Trib 4 as it enter the property.



Bottom left: looking downstream along Lake Mansfield Trib 5 shortly after it enters the property

Bottom right: looking downstream at Lake Mansfield Trib 5 as it approaches the wooden footbridge and joins with Trib 4 (to the right)

Lake Mansfield Tributary 6: This first order streams enters the property along its northern boundary and flows south to the northern edge of Lake Mansfield through mixed woods forest cover. The restoration area begins shortly after it passes beneath a small wooden footbridge and ends as it approaches a larger wooden footbridge. Total length: 235 ft. See SWA inventory sheet for more details.



(Left: Looking upstream at Lake Mansfield Trib 6 as it approaches the larger wooden footbridge at the downstream end of the restoration area; Right: Looking downstream at Lake Mansfield Trib 6 from where the restoration area begins just below a smaller wooden footbridge.)

Miller Brook Tributary 1: This 2nd order stream flows south into the northern boundary of the property, in the property's eastern portion. Until after crosses under Nebraska Valley Rd. It is too bouldery to be of adequate structure to benefit from SWA. From there on it is well-suited until it nears a small impoundment of water that holds back Miller Brook in the eastern area of the property. Total length: 236 ft. See SWA inventory sheet for more details.



(Left: Looking upstream at Miller Brook Trib 1 as it approaches the impoundment area at the downstream end of planned restoration; Right: Looking downstream at Miller Brook Trib 1 from where the restoration area begins just below a large culvert through Nebraska valley Rd.)

FFI – Tool Calculations for Lake Mansfield Headwaters Strategic Wood Additions – Final Design

Mapped floodplain areas that are planned for restored connectivity as a result of the SWA implementation are input to the nearest river corridor unit.

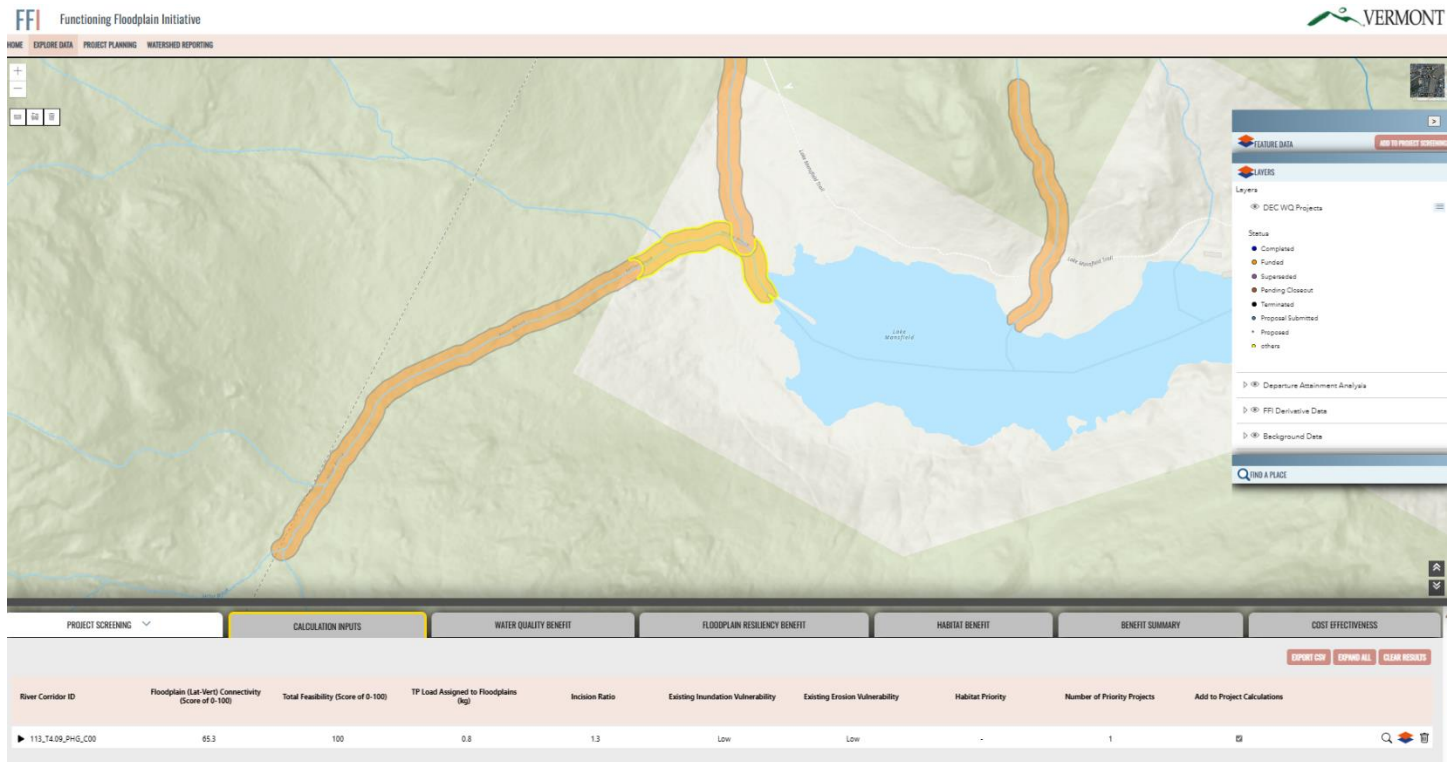
Project totals: 0.90 acres of vertically reconnected floodplain along 0.53 miles of 1st and 2nd order stream.

75.6 kg phosphorous avoided over 15 yr project lifespan.

Lake Mansfield Tribs 1, 2, 3, 4, and 5 → **113_T4.09_PHG_C00**

Total area of planned floodplain reconnection: 0.89 acres

Total p-reduction (15 yr lifespan): 67.6 kg





FEATURE DATA [ADD TO PROJECT SCREENING](#)

LAYERS

Layers

- DEC WQ Projects

Status

- Completed
- Cancelled
- Superseded
- Pending Closeout
- Terminated
- Proposal Submitted
- Proposed
- Others

Departure Attainment Analysis

FFI Derivative Data

Background Data

Q FIND A PLACE

EXPORT CSV CLEAR RESULTS

Enter Proposed Information for Potential Stream Stability Projects Below:

Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)					STORAGE					Proposed Incision Ratio	Area with Vertical Change (acres)
	River Corridor Area (acres)	50-Ft Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Low Protections Area (acres)	No Protection Area (acres)	Naturally Vegetated Buffer Area (acres)			
113_T4.09_PHG_C00	Existing	2.1	2.1	1.3	2.1	0	2.1	0	0	2.0	-	-
	Proposed Project Values	-	-	1.3							1	0.89

Stream Connectivity (Longitudinal-Temporal) Crediting



FEATURE DATA [ADD TO PROJECT SCREENING](#)

LAYERS

Layers

- DEC WQ Projects

Status

- Completed
- Cancelled
- Superseded
- Pending Closeout
- Terminated
- Proposal Submitted
- Proposed
- Others

Departure Attainment Analysis

FFI Derivative Data

Background Data

Q FIND A PLACE

EXPORT CSV CLEAR RESULTS

Enter Proposed Information for Potential Stream Stability Projects Below:

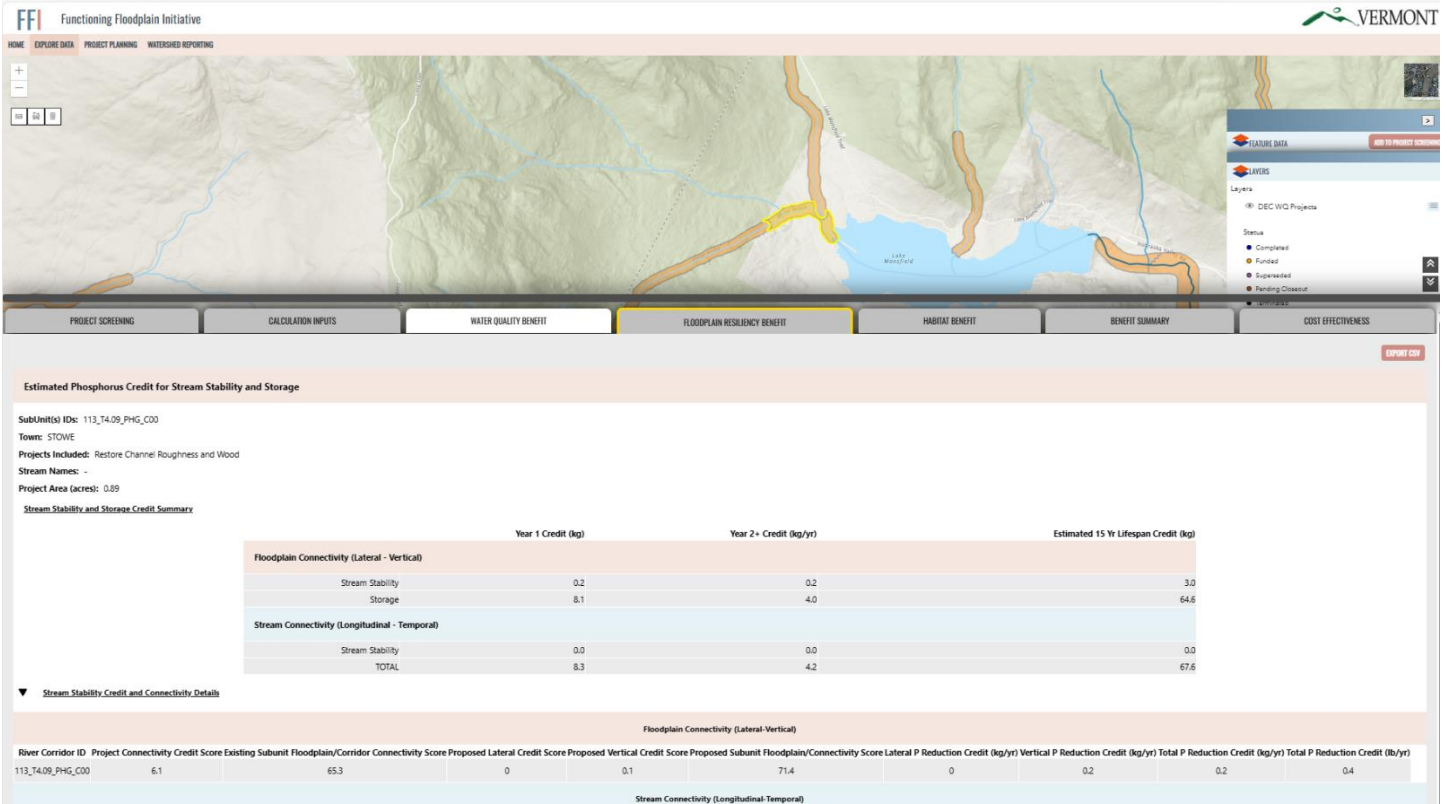
Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)		Project Area Connectivity		STORAGE	
	Existing Reach Connectivity	Existing Incision Ratio	Existing Reach Connectivity	Existing Incision Ratio	Proposed Project Area (acres)	Proposed Incision Ratio
113_T4.09_PHG_C00	Existing	1.3	Low	1.3	0.89	1
	Proposed Project Values		Low	High	0.89	

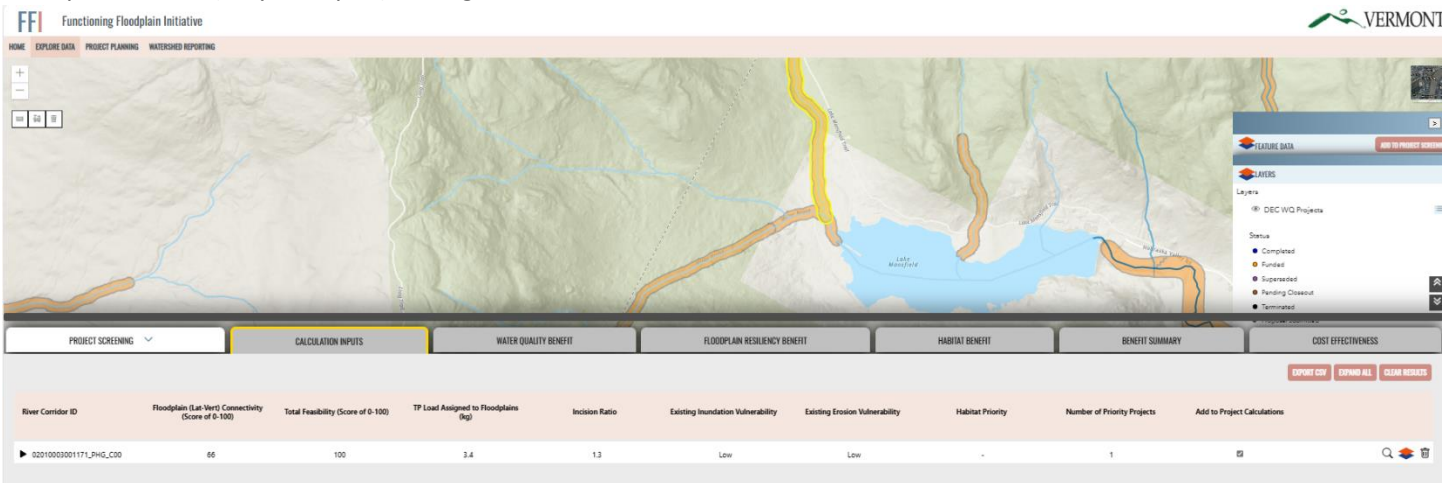
Stream Connectivity (Longitudinal-Temporal) Crediting

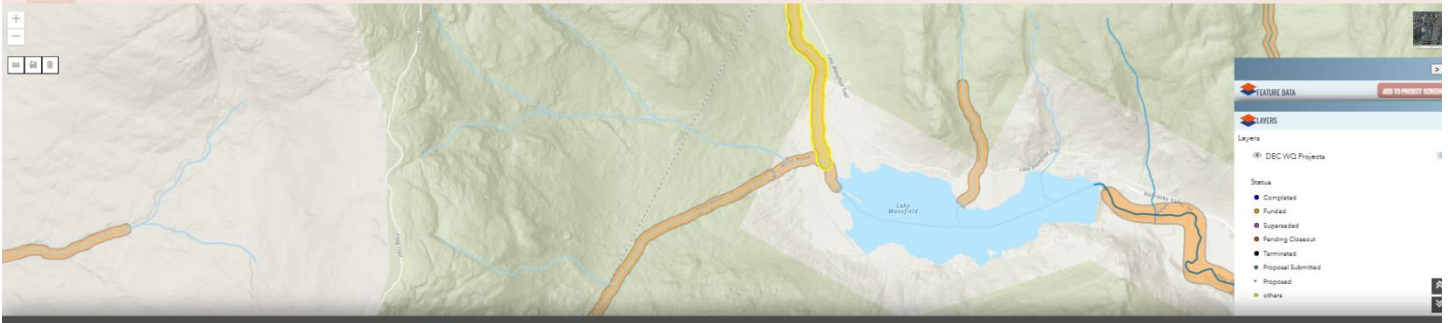


Lake Mansfield Trib 5 → **02010003001171_PHG_C00**

Total area of planned floodplain reconnection: 0.11 acres

Total p-reduction (15 yr lifespan): 8.0 kg





PROJECT SCREENING | CALCULATION INPUTS | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

Enter Proposed Information for Potential Stream Stability Projects Below: EXPORT CSV CLEAR RESULTS

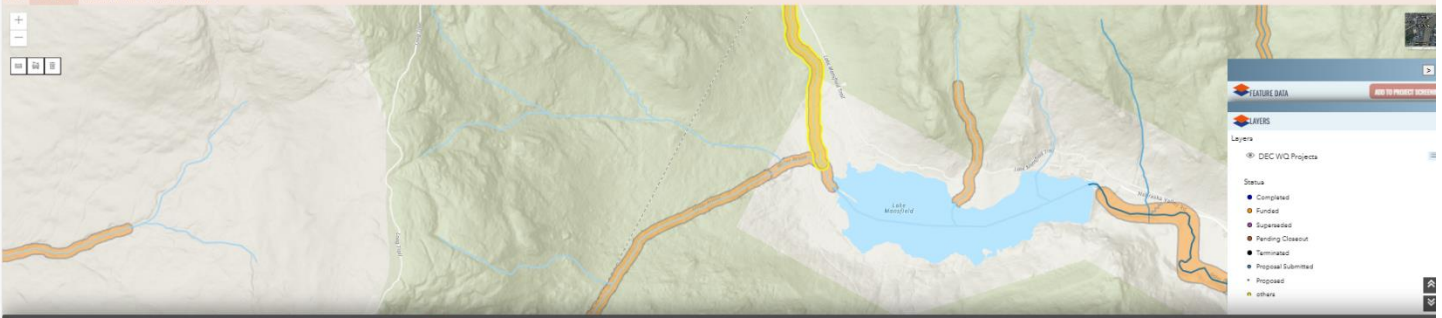
Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects

Restore Channel Slope Remove Minor Constraint Remove Berm
 Plant Floodplain Adapt River Corridor Bylaws Restore Wetland
 Plant River Corridor Create Flood Bench Remove Major Constraint
 Reconnect Flood Chute Plant 50-Foot Riparian Area Implement River Corridor Easement
 NRCS Wetland Reserve Raise Channel Lower Floodplain
 Restore Channel Roughness and Wood

River Corridor ID	STREAM STABILITY (FLOODPLAINS)					STORAGE					
	River Corridor Area (acres)	50-ft Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Low Protections Area (acres)	No Protection Area (acres)	Naturally Vegetated Buffer Area (acres)	Proposed Incision Ratio	Area with Vertical Change (acres)
02010003001171_PHG_C00	Existing 9.3	9.3	1.3	9.3	0	9.3	0	0	9.3		
	Proposed Project Values										
			1.3							1	11

Stream Connectivity (Longitudinal-Temporal) Crediting



PROJECT SCREENING | CALCULATION INPUTS | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

Enter Proposed Information for Potential Stream Stability Projects Below: EXPORT CSV CLEAR RESULTS

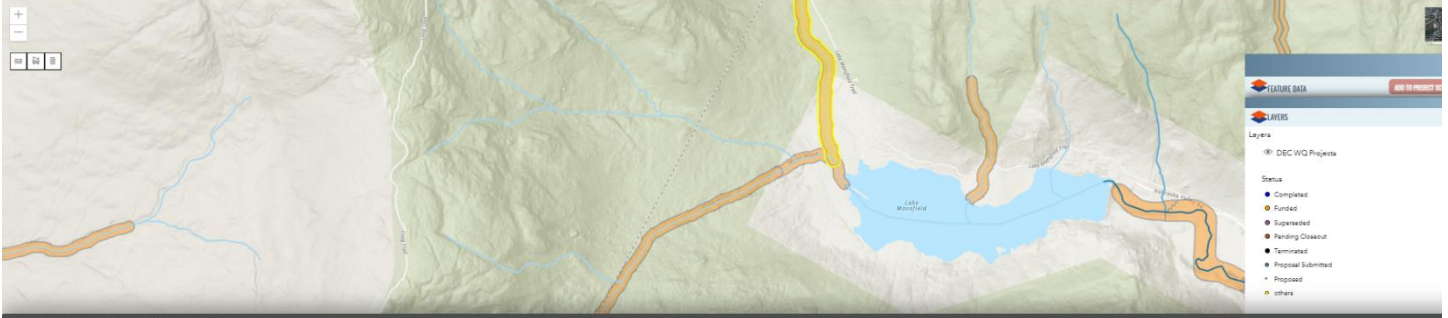
Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects

Restore Channel Slope Remove Minor Constraint Remove Berm
 Plant Floodplain Adapt River Corridor Bylaws Restore Wetland
 Plant River Corridor Create Flood Bench Remove Major Constraint
 Reconnect Flood Chute Plant 50-Foot Riparian Area Implement River Corridor Easement
 NRCS Wetland Reserve Raise Channel Lower Floodplain
 Restore Channel Roughness and Wood

River Corridor ID	STREAM STABILITY (FLOODPLAINS)		STORAGE	
	Existing	Existing Reach Connectivity	Project Area Connectivity	Proposed Project Area (acres)
02010003001171_PHG_C00	Existing	Low		
	Proposed Project Values			
		Low	High	11

Stream Connectivity (Longitudinal-Temporal) Crediting



Estimated Phosphorus Credit for Stream Stability and Storage

SubUnit(s) ID: 02010003001171_PHG_C00
 Town: STOWE
 Projects Included: Restore Channel Roughness and Wood
 Stream Names: -
 Project Area (acres): 0.11
Stream Stability and Storage Credit Summary

	Year 1 Credit (kg)	Year 2+ Credit (kg/yr)	Estimated 15 Yr Lifespan Credit (kg)
Floodplain Connectivity (Lateral - Vertical)			
Stream Stability	0.0	0.0	0.0
Storage	1.0	0.5	8.0
Stream Connectivity (Longitudinal - Temporal)			
Stream Stability	0.0	0.0	0.0
TOTAL	1.0	0.5	8.0

▼ Stream Stability Credit and Connectivity Details

Floodplain Connectivity (Lateral-Vertical)										
River Corridor ID	Project Connectivity Credit Score	Existing Subunit Floodplain/Corridor Connectivity Score	Proposed Lateral Credit Score	Proposed Vertical Credit Score	Proposed Subunit Floodplain/Connectivity Score	Lateral P Reduction Credit (kg/yr)	Vertical P Reduction Credit (kg/yr)	Total P Reduction Credit (kg/yr)	Total P Reduction Credit (lb/yr)	
02010003001171_PHG_C00	0.2	66	0	0	66.2	0	0	0	0.1	

Project 3

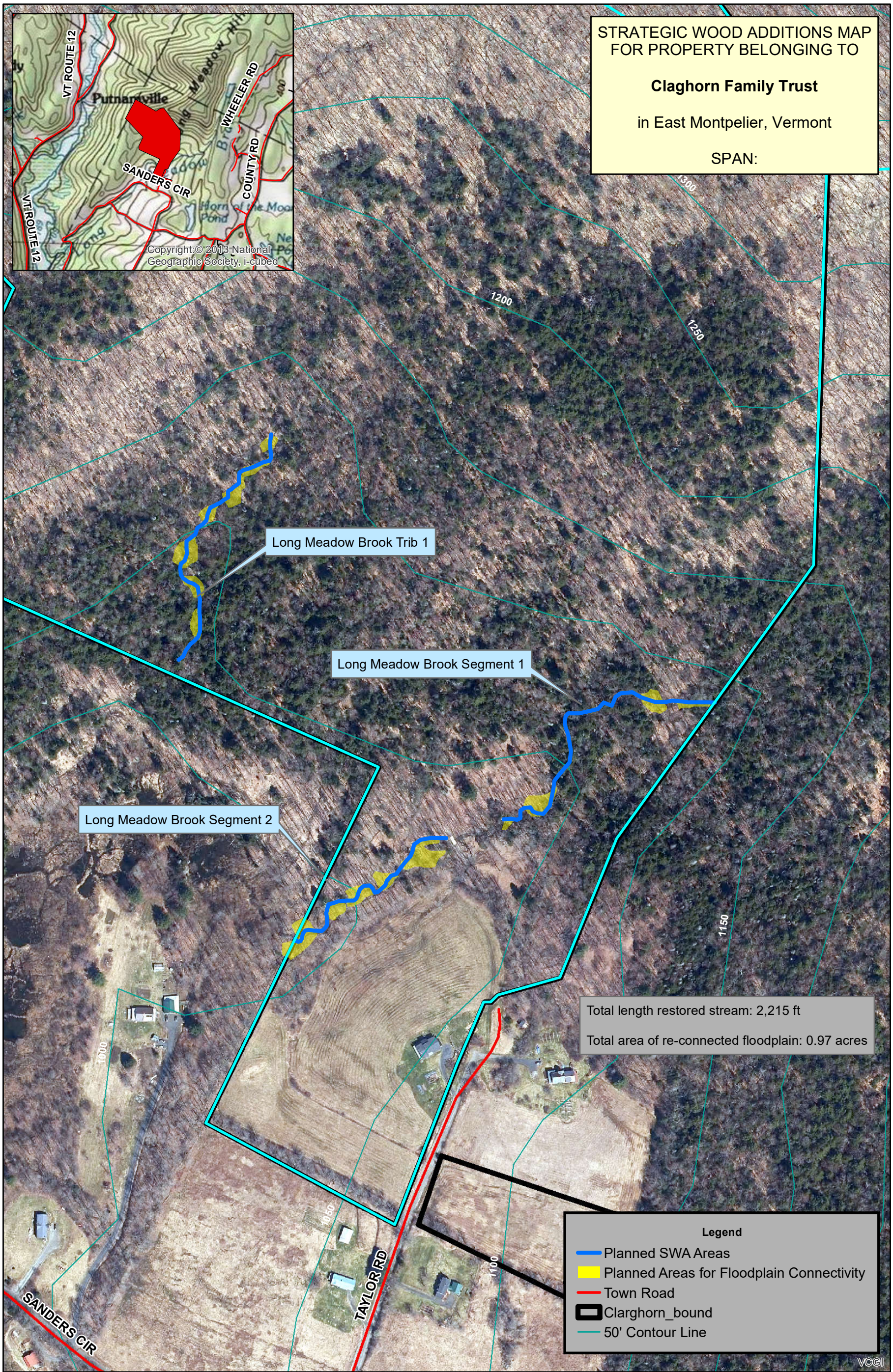
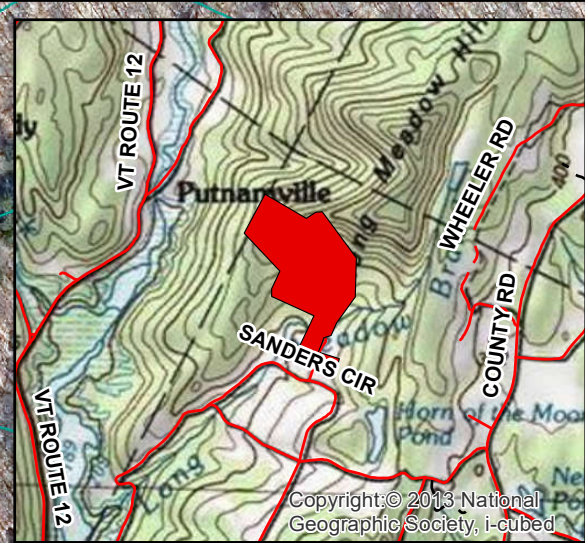
Long Meadow Brook Strategic Wood Additions – East Montpelier

STRATEGIC WOOD ADDITIONS MAP
FOR PROPERTY BELONGING TO

Claghorn Family Trust

in East Montpelier, Vermont

SPAN:



Total length restored stream: 2,215 ft
Total area of re-connected floodplain: 0.97 acres

Legend

- Planned SWA Areas
- Planned Areas for Floodplain Connectivity
- Town Road
- Claghorn_bound
- 50' Contour Line

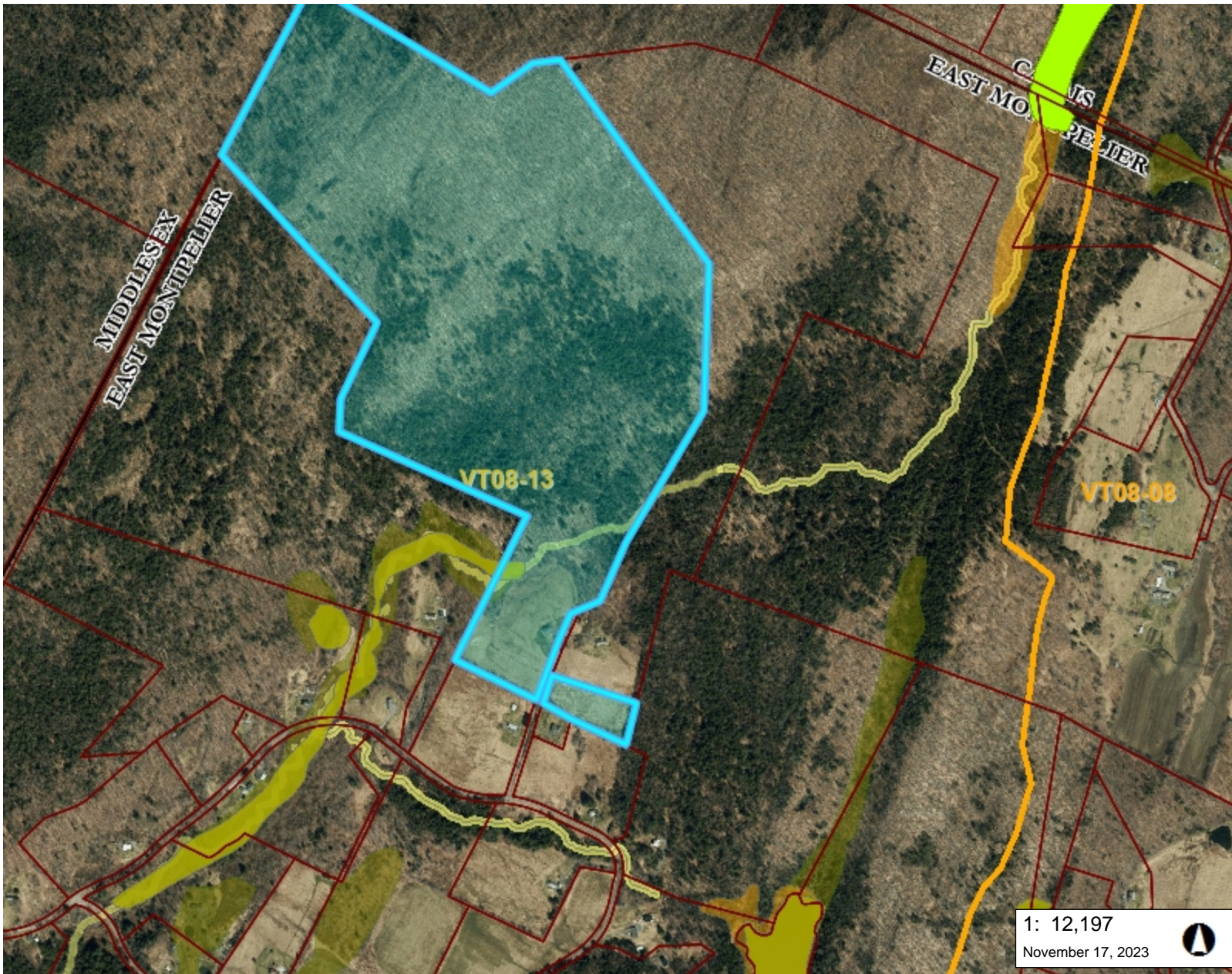
Orthophoto Series 5000: 2022
Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400
This map was created from the Town of East Montpelier tax maps, handheld GPS points, and on the ground observations.
THIS IS NOT A SURVEY

N
1:3,000
1 inch = 250 feet

0 150 300 600 Feet

Map Created By: Redstart
10/2023





LEGEND

- Wetland - VSWI
 - Class 1 Wetland
 - Class 2 Wetland
 - Wetland Buffer
- Wetlands Advisory Layer
- River Main Stem Waterbodies
- WBID Watersheds
- Flood Hazard Areas (Only FEM)
 - AE (1-percent annual chance flood)
 - A (1-percent annual chance floodpl.)
 - AO (1-percent annual chance zone feet)
 - 0.2-percent annual chance flood ha
- River Corridors (Aug 27, 2019)
 - .5 - 2 sqmi.
 - .25-.5 sqmi.
- Soils - Hydric
- Parcels (standardized)
- ACT250 Permits
- Town Boundary

1: 12,197
November 17, 2023

NOTES

Project Screening Map created using ANR's Natural Resources Atlas

620.0 0 310.00 620.0 Meters
 WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 1016 Ft. 1cm = 122 Meters
 © Vermont Agency of Natural Resources THIS MAP IS NOT TO BE USED FOR NAVIGATION

DISCLAIMER: This map is for general reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable. ANR and the State of Vermont make no representations of any kind, including but not limited to, the warranties of merchantability, or fitness for a particular use, nor are any such warranties to be implied with respect to the data on this map.

Strategic Wood Additions (SWA) Inventory

Strategic Wood Additions (SWA) Inventory															
Landowner Name:				Claghorn			Inventory Date:			3/8/2023					
Town:				East Montpelier			Planner Name:			Redstart					
Stream Name	Downstream Lat/Long	Upstream Lat/Long	Stream Segment ID	Watershed Size (ac.)	Segment Length (ft)	Bankfull Width (ft)	Stream Slope %	Bed - Sediment (e.g. sand)	Existing Wood in Stream pcs/100'	Distance to Downstream X-ing Structures (ft)	Type/ Size of X-ing Structure	Brook Trout Present	Suitable Tree Cover (Y/N)	Total added wood in coarse sized pieces	Detailed work plan
1 Long Meadow Brook	44.33205, -72.54468	44.33307, -72.54435	1	410	851	8	8%	cobble	1	150 ft	Forest trail, bank-spanning iron bridge	unknown	Y	34	8-11 channel-spanning structures. 3-4 pieces of coarse wood material per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>10" diameter) secured across banks every 300' and at downstream end. Downstream end at safe distance from private bridge.
2 Long Meadow Brook	44.33119, -72.54889	44.33192, -72.54737	2	461	589	7	3%	cobble	<1	2,200 ft	Sanders Circle culvert	unknown	Y	24	6-8 channel-spanning structures. 3-4 pieces of coarse wood material per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>10" diameter) secured across banks every 300' and at downstream end. Downstream end at property boundary.
3 Long Meadow Brook Trib 1	44.33320, -72.55005	44.33486, -72.54914		90	775	7	7%	cobble/gravel	1	2,100 ft	Sanders Circle culvert	unknown	Y	31	8-10 channel-spanning structures. 3-4 pieces of coarse wood material per structure, average. Some structures may contain additional wood counting toward stream total in order to maximize floodplain engagement, while still maintaining recommended canopy cover and bank trees in these areas. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>10" diameter) secured across banks every 300' and at downstream end. Downstream end just above small rocky cascade near property boundary.

Long Meadow Brook SWA Pre-Implementation Documentation

Long Meadow Brook Segment 1: The restoration area starts at the western property boundary. It meanders through mixed woods with a northern hardwood component and a hemlock component, reaching a red maple dominated forest near the lowest elevation of the property. There are areas of both steep rocky stream bank and flat floodplains that the stream passes through, some floodplain areas that are more accessible than others. The downstream end is located 150 ft upstream from a bridge, at a location approved by the landowner for SWA work. Total length: 851 ft.



(Left: Long Meadow Brook S1 looking upstream from the end point of restoration area; Right: looking upstream from near where it passes beyond the small footbridge.)

Long Meadow Brook, Segment 2: Just beyond an Iron and wood bank-spanning bridge, the restoration area for Long Meadow Brook resumes. It meanders along a low-gradient forested floodplain and exits the property at a prominent oxbow. Total length: 559 ft. See more details in SWA inventory sheet.



(Left: Long Meadow Brook S2 as it exits the property; Right: looking upstream at the start point of the restoration area, just beyond the bridge.)

Long Meadow Brook, Tributary 1: The restoration area begins just downstream of a small wooden footbridge. The stream meanders through a mixed wood area with a northern hardwood component and a spruce component. The downstream end is just above a waterfall quite close to a southern boundary of the property. Total length: 775 ft.



(Left: Long Meadow Brook Trib 1 as it reaches the waterfall, looking upstream; Right: looking downstream at the start point of the restoration area, just beyond the small footbridge.)

FFI – Tool Calculations for Long Meadow Brook Strategic Wood Additions – Final Design

Mapped floodplain areas that are planned for restored connectivity as a result of the SWA implementation are input to the nearest downstream river corridor unit.

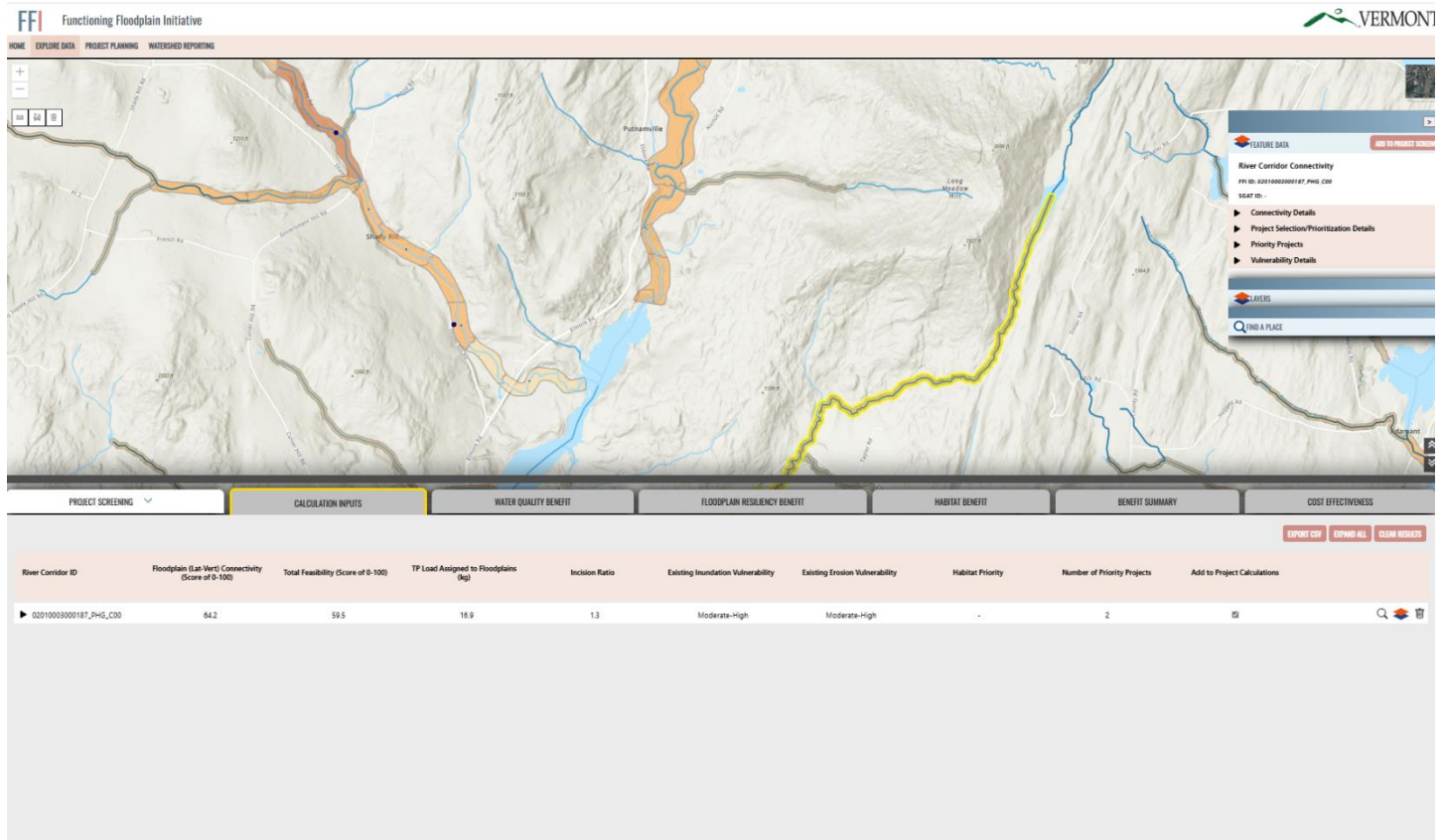
Project totals: 0.97 acres of vertically reconnected floodplain along 0.42 miles of 1st order stream.

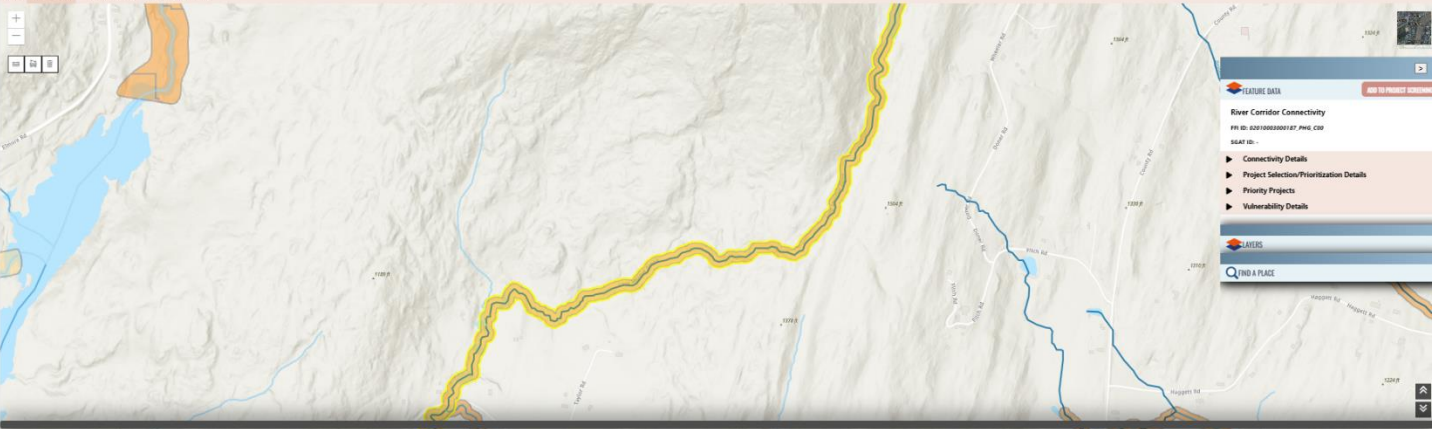
75.0 kg phosphorous avoided over 15 yr project lifespan.

Long Meadow Brook Segments 1 and 2, Long Meadow Brook Trib 1 → **02010003000187_PHG_C00**

Total area of planned floodplain reconnection: 0.97 acres

Total p-reduction (15 yr lifespan): 75.0 kg





Enter Proposed Information for Potential Stream Stability Projects Below EXPORT CSV CLEAR RESULTS CALCULATE

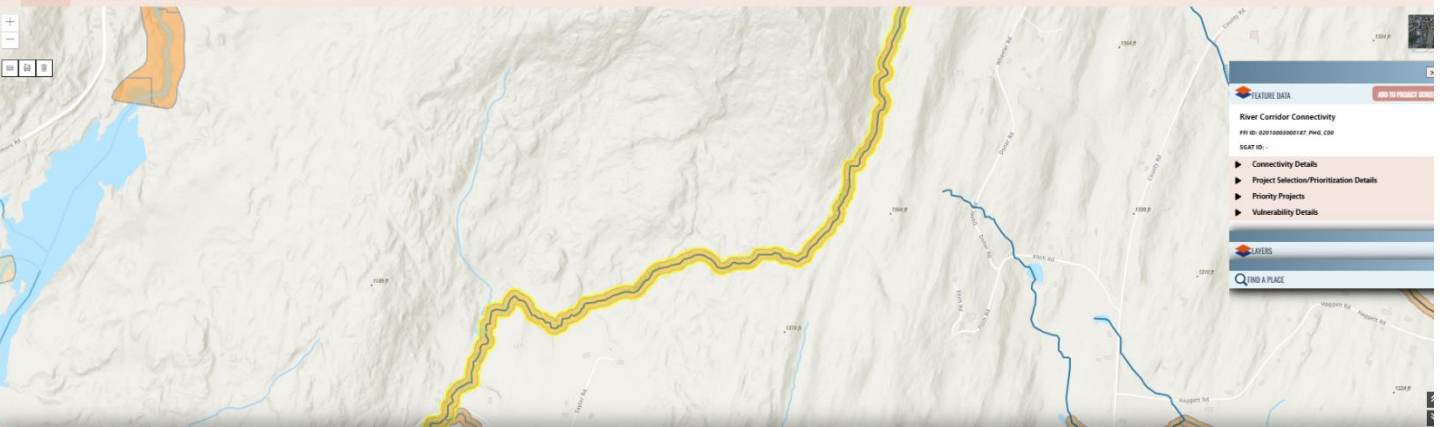
Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Barr
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)				STORAGE						
	River Corridor Area (acres)	50-ft Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Low Protection Area (acres)	No Protection Area (acres)	Naturally Vegetated Buffer Area (acres)	Proposed Incision Ratio	Area with Vertical Change (acres)
02010003001187_PHS_C00	Existing 33.2	33.2	1.3	32.8	0	30.7	2.3	0.2	31.3	-	-
	Proposed Project Values										
	-	-	1.3							1	0.97

Stream Connectivity (Longitudinal-Temporal) Crediting



Enter Proposed Information for Potential Stream Stability Projects Below EXPORT CSV CLEAR RESULTS CALCULATE

Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Barr
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)		STORAGE	
	Existing	Existing Reach Connectivity	Project Area Connectivity	Proposed Project Area (acres)
02010003001187_PHS_C00	Existing	Low	-	-
	Proposed Project Values			
		Low	High	0.03

Stream Connectivity (Longitudinal-Temporal) Crediting



EXPORT CSV

Estimated Phosphorus Credit for Stream Stability and Storage

SubUnit(s) ID(s): 02010003000187_PHG_C00

Town: EAST MONTPELIER

Projects Included: Restore Channel Roughness and Wood

Stream Names: -

Project Area (acres): 0.97

Stream Stability and Storage Credit Summary

	Year 1 Credit (kg)	Year 2+ Credit (kg/yr)	Estimated 15 Yr Lifespan Credit (kg)
Floodplain Connectivity (Lateral - Vertical)			
Stream Stability	0.3	0.3	4.5
Storage	8.8	4.4	70.5
Stream Connectivity (Longitudinal - Temporal)			
Stream Stability	0.0	0.0	0.0
TOTAL	9.1	4.7	75.0

Stream Stability Credit and Connectivity Details

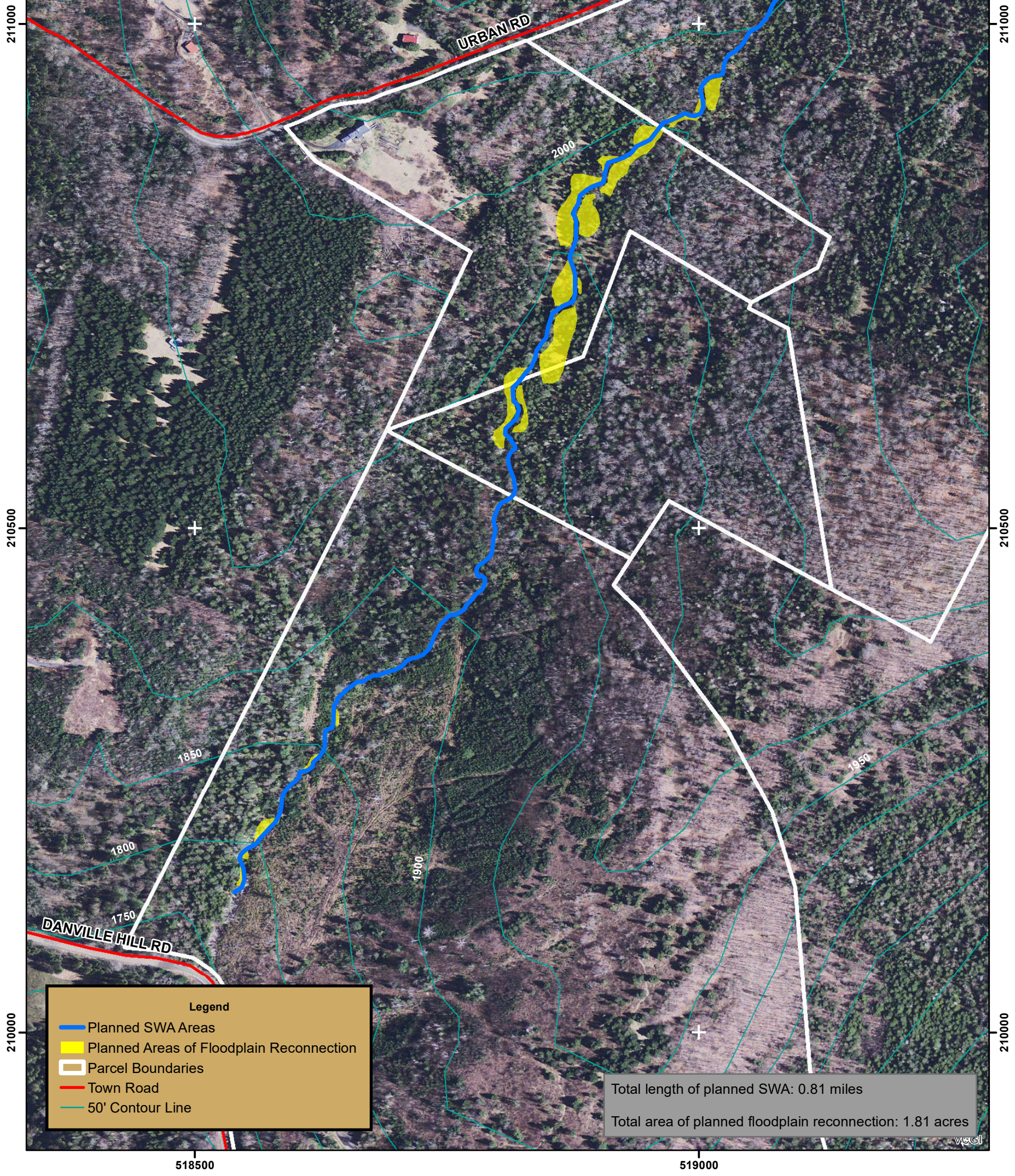
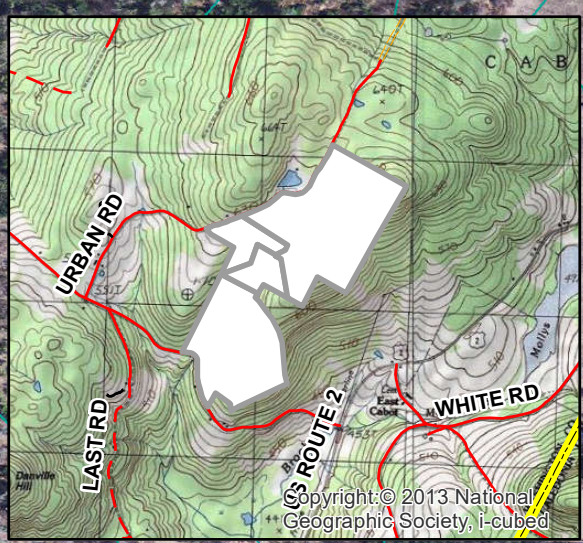
River Corridor ID	Project Connectivity Credit Score	Existing Subunit Floodplain/Corridor Connectivity Score	Floodplain Connectivity (Lateral-Vertical)							
			Proposed Lateral Credit Score	Proposed Vertical Credit Score	Proposed Subunit Floodplain/Connectivity Score	Lateral P Reduction Credit (kg/yr)	Vertical P Reduction Credit (kg/yr)	Total P Reduction Credit (kg/yr)	Total P Reduction Credit (lb/yr)	
02010003000187_PHG_C00	0.4	64.2	0	0	64.6	0	0.3	0.3	0.6	

Stream Connectivity (Longitudinal-Temporal)

Project 4

Mollys Brook Tributary Strategic Wood Additions – Cabot

STRATEGIC WOOD ADDITIONS MAP
FOR PROPERTIES BELONGING TO
**GARY GULKA, BILL PENDERGRAFT,
ED FELTUS, KATHERINE JONES-LIPPY**
in Cabot, Vermont



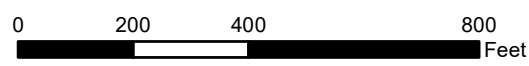
Legend

- Planned SWA Areas
- Planned Areas of Floodplain Reconnection
- Parcel Boundaries
- Town Road
- 50' Contour Line

Total length of planned SWA: 0.81 miles
Total area of planned floodplain reconnection: 1.81 acres

Orthophoto Series 5000; 2015
Coordinate System: NAD 1983 StatePlane Vermont FIPS 4400
This map was created from the Town of Cabot tax maps, handheld GPS points, and on the ground observations.
THIS IS NOT A SURVEY

N
1:4,000
1 inch = 333.3 feet



Map Created By: Redstart
12/2023





LEGEND

- Wetland - VSWI
 - Class 1 Wetland
 - Class 2 Wetland
 - Wetland Buffer
- Wetlands Advisory Layer
- River Main Stem Waterbodies
- WBID Watersheds
- Flood Hazard Areas (Only FEM)**
 - AE (1-percent annual chance flood)
 - A (1-percent annual chance floodpl.)
 - AO (1-percent annual chance zone feet)
 - 0.2-percent annual chance flood ha
- River Corridors (Aug 27, 2019)
 - .5 - 2 sqmi.
 - .25-.5 sqmi.
- Soils - Hydric
- Parcels (standardized)
- ACT250 Permits
- Town Boundary

NOTES

Map created using ANR's Natural Resources Atlas

500.0 0 250.00 500.0 Meters

WGS_1984_Web_Mercator_Auxiliary_Sphere 1" = 819 Ft. 1cm = 98 Meters

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Strategic Wood Additions (SWA) Inventory

Landowner Names:			Gulka, Pendergraft, Feltus, Jones-Lippy			Inventory Date:			9/15/2023			See SWA Inventory Sheet Read Me for more information on each Column Heading			
Town:			Cabot			Planner Name:			Redstart						
Stream Name	Downstream Lat/Long	Upstream Lat/Long	Stream Order	Watershed Size (ac.)	Segment Length (ft)	Bankfull Width (ft)	Stream Slope %	Bed - Sediment (e.g. sand)	Existing Wood in Stream pcs/100'	Distance to Downstream X-ing Structures (ft)	Type/ Size of X-ing Structure	Brook Trout Present	Suitable Tree Cover (Y/N)	Total Added Wood in Coarse sized pieces	Detailed Work Plan
1 Molly's Brook Trib 1	44.39120, -72.26730	44.40020, -72.26030	1	243	4,296	7	8%	cobble/gravel/s and	2	300 ft	Danville Rd. metal culvert	unknown	Y	172	34-58 channel-spanning structures, palced strategically to reduce incision and maximize reconnection with adjacent floodplain. 3-5 pieces of coarse wood material per structure, average. Additional fine wood materials placed in structures to accelerate sediment capture. Strainer (>8" diameter) secured across banks every 300' and at downstream end. Downstream end at approach to Danville Road.

Mollys Brook Tributary Strategic Wood Additions

Pre-Implementation Documentation

Site visit by Bill Musson, 9/2023

Molly's Brook Tributary 1: This 1st order perennial stream flows south through mixed woods. It flows through the properties of four neighboring forest-owners, who are on good terms and agree about the project moving forward. The northern and upper extent of the restoration area is just below a culvert under Urban Farm Way. The downstream end of the planned restoration is 300 ft prior to where the stream reaches a culverted crossing of Danville Hill Road. Parts of the stream, especially along its central reach, feature extensive floodplain that can be further connected by having more wood in the stream. Total length: 4296 ft. See SWA Inventory Sheet for more details.



(Left above: looking at the restoration start point below Urban Farm Way.)



(Left below: looking at the abandoned floodplain along a reach of Molly's Brook Trib 1.)

FFI – Tool Calculations for Mollys Brook Tributary Strategic Wood Additions – Final Design

Mapped floodplain areas that are planned for restored connectivity as a result of the SWA implementation are input to the nearest downstream river corridor unit.

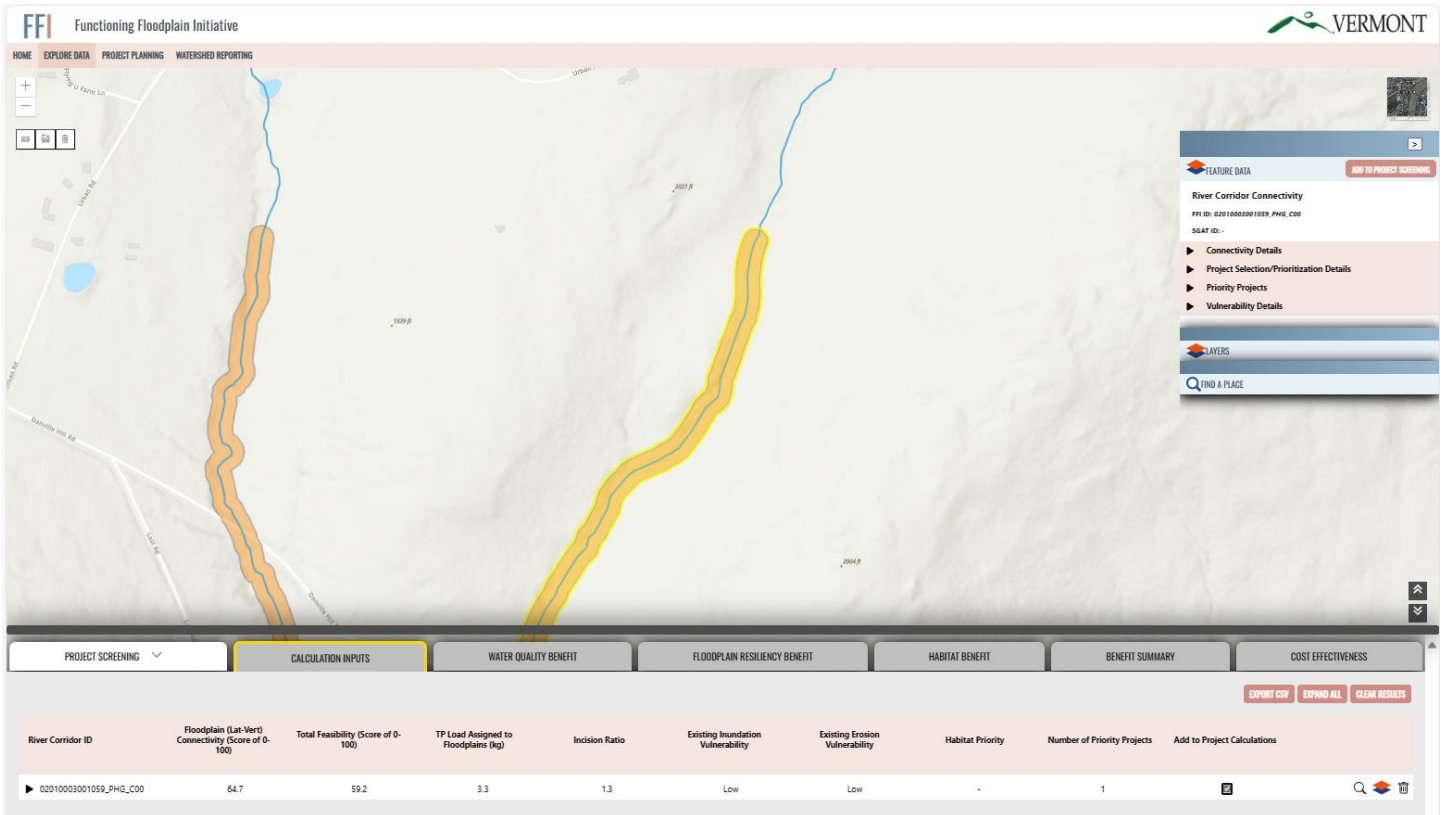
Project totals: 1.81 acres of vertically reconnected floodplain along 0.81 miles of 1st order stream.

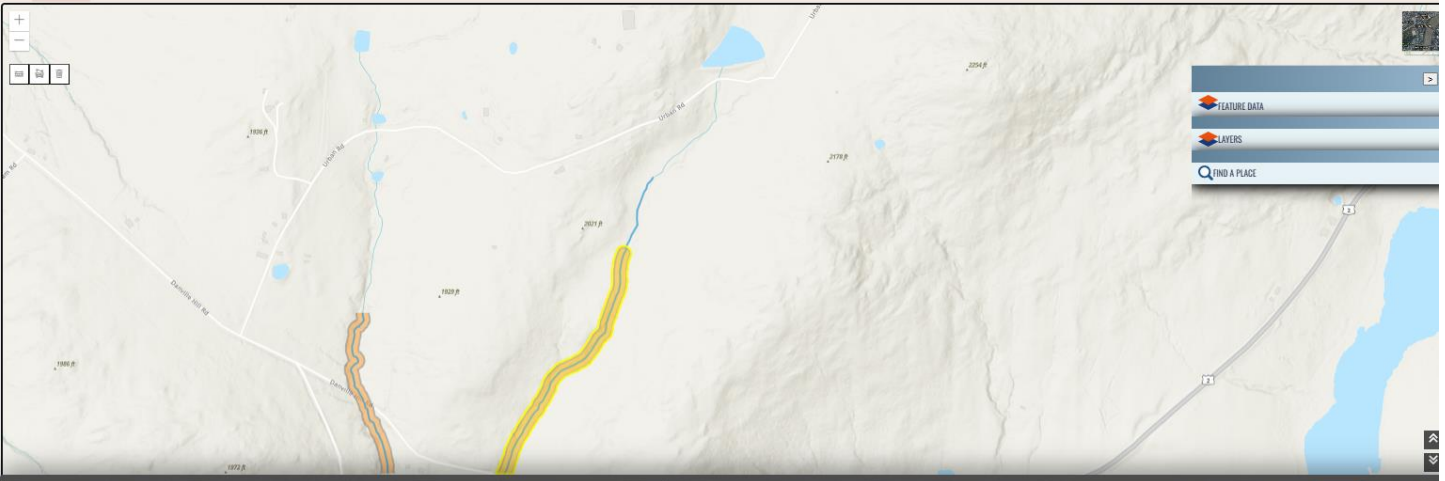
137.5 kg phosphorous avoided over 15 yr project lifespan.

Mollys Brook Tributary 1 → **02010003001059_PHG_C00**

Total area of planned floodplain reconnection: 1.81 acres

Total p-reduction (15 yr lifespan): 137.5 kg





FEATURE DATA
LAYERS
FIND A PLACE

PROJECT SCREENING | CALCULATION INPUTS | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

EXPORT CSV CLEAR RESULTS

Enter Proposed Information for Potential Stream Stability Projects Below:

CALCULATE

Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
- Plant Floodplain
- Plant River Corridor
- Reconnect Flood Chute
- NRCS Wetland Reserve
- Restore Channel Roughness and Wood
- Remove Minor Constraint
- Adopt River Corridor Bylaws
- Create Flood Bench
- Plant 50-Foot Riparian Area
- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)					STORAGE					
	River Corridor Area (acres)	50-ft Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Low Protections Area (acres)	No Protection Area (acres)	Naturally Vegetated Buffer Area (acres)	Proposed Incision Ratio	Area with Vertical Change (acres)
02010003001059_PHG_C00	Existing 8.9	8.9	1.3	8.7	0	8.9	0	0	8.7	-	-
	Proposed Project Values	-	-	1.3						1.0	1.81

Stream Connectivity (Longitudinal-Temporal) Crediting



FEATURE DATA
LAYERS
FIND A PLACE

PROJECT SCREENING | CALCULATION INPUTS | WATER QUALITY BENEFIT | FLOODPLAIN RESILIENCY BENEFIT | HABITAT BENEFIT | BENEFIT SUMMARY | COST EFFECTIVENESS

EXPORT CSV CLEAR RESULTS

Enter Proposed Information for Potential Stream Stability Projects Below:

CALCULATE

Floodplain Connectivity (Lateral-Vertical) and Storage Crediting

Proposed River Corridor and Floodplain Projects:

- Restore Channel Slope
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- Raise Channel
- Remove Berm
- Restore Wetland
- Remove Major Constraint
- Implement River Corridor Easement
- Lower Floodplain

River Corridor ID	STREAM STABILITY (FLOODPLAINS)		Existing Reach Connectivity		Project Area Connectivity		STORAGE	Proposed Project Area (acres)
	River Corridor Area (acres)	50-ft Riparian Area (acres)	Existing Incision Ratio	Unconstrained River Corridor Area (acres)	Robust Protection Area (acres)	Moderate Protection Area (acres)	Naturally Vegetated Buffer Area (acres)	Proposed Project Area (acres)
02010003001059_PHG_C00	Existing 8.9	8.9	1.3	8.7	0	8.9	8.7	-
	Proposed Project Values	-	-	1.3	Low	High		1.81

Stream Connectivity (Longitudinal-Temporal) Crediting



EXPORT CSV

Estimated Phosphorus Credit for Stream Stability and Storage

SubUnit(s) IDs: 02010003001059_PHG_C00
 Town: CABOT
 Projects Included: Restore Channel Roughness and Wood
 Stream Names: -
 Project Area (acres): 1.81

Stream Stability and Storage Credit Summary

	Year 1 Credit (kg)	Year 2+ Credit (kg/yr)	Estimated 15 Yr Lifespan Credit (kg)
Floodplain Connectivity (Lateral - Vertical)			
Stream Stability	0.4	0.4	6.0
Storage	16.4	8.2	131.5
Stream Connectivity (Longitudinal - Temporal)			
Stream Stability	0.0	0.0	0.0
TOTAL	16.8	8.6	137.5

Stream Stability Credit and Connectivity Details

Floodplain Connectivity (Lateral-Vertical)

River Corridor ID	Project Connectivity Credit Score	Existing Subunit Floodplain/Corridor Connectivity Score	Proposed Lateral Credit Score	Proposed Vertical Credit Score	Proposed Subunit Floodplain/Connectivity Score	Lateral P Reduction Credit (kg/yr)	Vertical P Reduction Credit (kg/yr)	Total P Reduction Credit (kg/yr)	Total P Reduction Credit (lb/yr)
02010003001059_PHG_C00	2.7	64.7	0	0.1	67.5	0	0.4	0.4	0.9

Letters of Support

**Landowner Agreement & Permission to
Conduct Conservation Activities
(Strategic Wood Additions)**

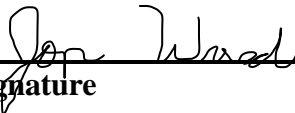
This form confirms landowner support for the planning, installation, and maintenance of Strategic Wood Additions on their property. This permission is limited to Strategic Wood Additions, which is implemented in a single treatment. The landowner understands that this practice includes strategically placing woody material from felled trees into the stream to improve water quality, enhance aquatic habitat, and increase flood resilience. This practice will be implemented in conformance with standards outlined in the *Strategic Wood Addition Handbook* (Kratzer, 2020) and/or to meet or exceed standards outlined by the Natural Resources Conservation Service (NRCS). This form authorizes Redstart to plan and implement the Strategic Wood Addition practice, as well as to raise funds on behalf of the landowner to cover the costs of the work. Redstart is committed to implementing the activity at no cost to the landowner. This form does not allow Redstart to conduct any activities other than Strategic Wood Additions on the landowner's property.

Landowner Name: Rocky Woods Investments II LLC **Authorized Organization:** Redstart, Inc.
Representative: Jon Ward **Representative:** Ben Machin
Property Location: West of VT-12 **Address:** 2332 Goose Green Road
Elmore VT, 05657 Bradford, VT 05033
Property SPAN: 201-064-10574
Approximate Timing: 10/1/2024 – 12/31/2026

Landowner Concurrence


By signing this form, I, the landowner, agree that Redstart has permission to plan and install Strategic Wood Additions on the land identified.

Landowner Signature:

Jon Ward  **Date:** 10/06/2023

Print Name **Signature**

Redstart Signature:

Ben Machin  **Date:** 10/06/2023

Print Name **Signature**

The Nature Conservancy
575 Stonecutters Way, Suite 2
Montpelier, VT 05602

October 11, 2023

RE: Strategic Wood Addition (SWA) grant application

Dear Review Committee:

The Vermont Chapter of The Nature Conservancy (TNC) supports the enclosed application for funding a strategic wood addition. The Nature Conservancy has identified strategic wood addition as a priority tactic in achieving its own freshwater ecosystem and water quality restoration goals and we are currently working to expand this restoration practice throughout Vermont. Historic land- use and river management activities such as deforestation, channel snagging and dredging have resulted in a severe deficit of wood structure in rivers of the northeast and across the country.

Without wood structure, the balance between transport and retention of sediments and nutrients that once existed in our rivers is no longer, and downstream ecosystems and human communities are made worse off. By replenishing wood structure to rivers, the balance can be restored. Flow velocities are reduced, sediments trapped and floodplains re-engaged, resulting in lower downstream flood stages and increases in the uptake of nitrogen and phosphorus along headwaters, supporting riverscape food webs and effectively reducing harmful downstream loading.

TNC strongly supports this application.

Please do not hesitate to contact me if I can be of further assistance.

Sincerely,



Shayne Jaquith
Watershed Restoration Manager
The Nature Conservancy
575 Stonecutters Way, Suite 2
(802) 229-4425 X 105
Email: shayne.jaquith@tnc.org



(Internal) Fwd: SWA in Elmore - Rocky Woods - Jud and Bret review

1 message

Ben Machin <ben@redstartconsulting.com>

To: Dana Hazen <dana@redstartconsulting.com>, James King <james@redstartconsulting.com>

----- Forwarded message -----

From: **Ladago, Bret** <Bret.Ladago@vermont.gov>

Date: Fri, Oct 13, 2023 at 11:10 AM

Subject: RE: SWA in Elmore - Rocky Woods - Jud and Bret review

To: Ben Machin <ben@redstartconsulting.com>

Hi Ben,

I support this project. Thanks for checking.

-Bret



Bret Ladago (he/him) | Fish Biologist

Vermont Agency of Natural Resources | Fish & Wildlife Department

Fisheries Division

3902 Roxbury Rd. | Roxbury, VT 05669

802-485-7566 (o) | 802-431-7550 (c)

bret.ladago@vermont.gov

Connect with us on [Facebook](#), [Instagram](#), [Twitter](#) or our [website](#)



Michele Braun <michele@winooskiriver.org>

Strategic Woody Addition Design Project

1 message

Gary Gulka <gary.gulka@gmail.com>

Wed, Dec 13, 2023 at 12:24 PM

To: "michele@winooskiriver.org" <michele@winooskiriver.org>

Dear Michelle,

As Cabot landowner, I am fully in support of a Strategic Woody Addition project on a stream on my property. The adjacent landowner, Bill Pendergraft, just upstream of my property, is also in support of Strategic Woody Addition, which we hope can serve as a demonstration project for doing this work on private property. As a member and chair of Cabot's Flood Resiliency Task Force, we are hoping that SWA can be one of the techniques we employ in the future for flood mitigation, and we see this is a great opportunity in our efforts to slow and divert flows in upland areas.

Sincerely,

Gary Gulka